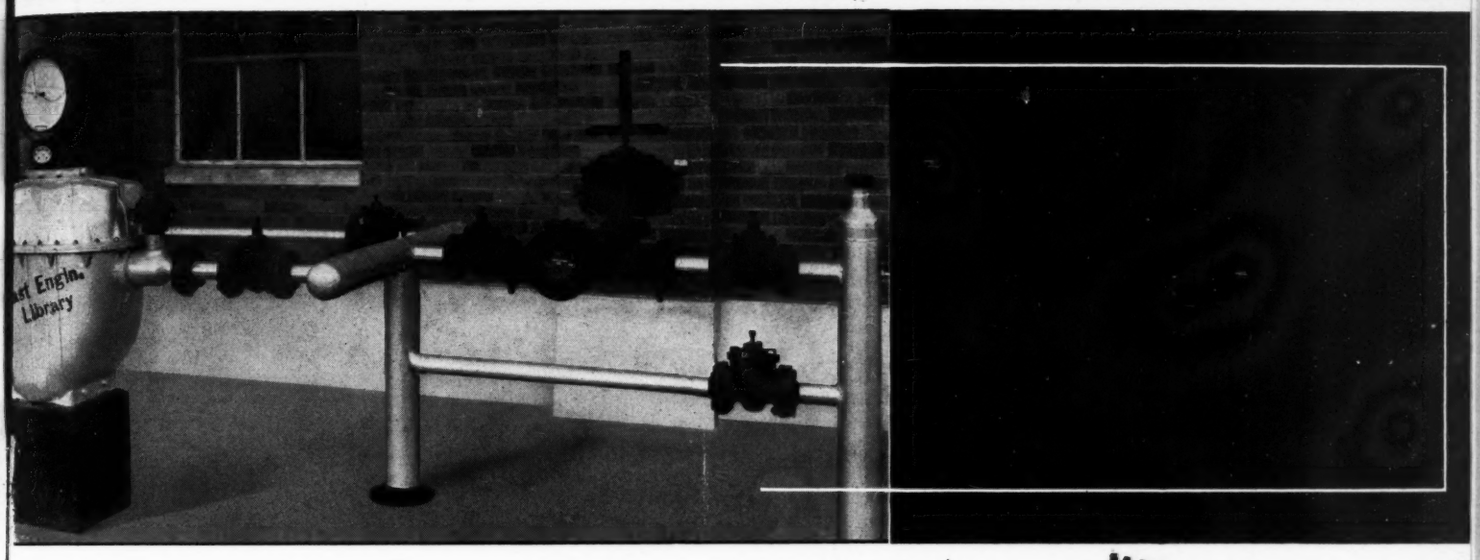
GAS

ENGINEERING • UTILIZATION • LOAD-BUILDING • MANAGEMENT



MAY 5 1942

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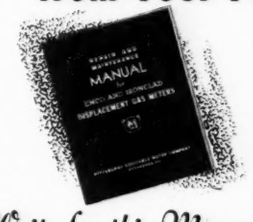

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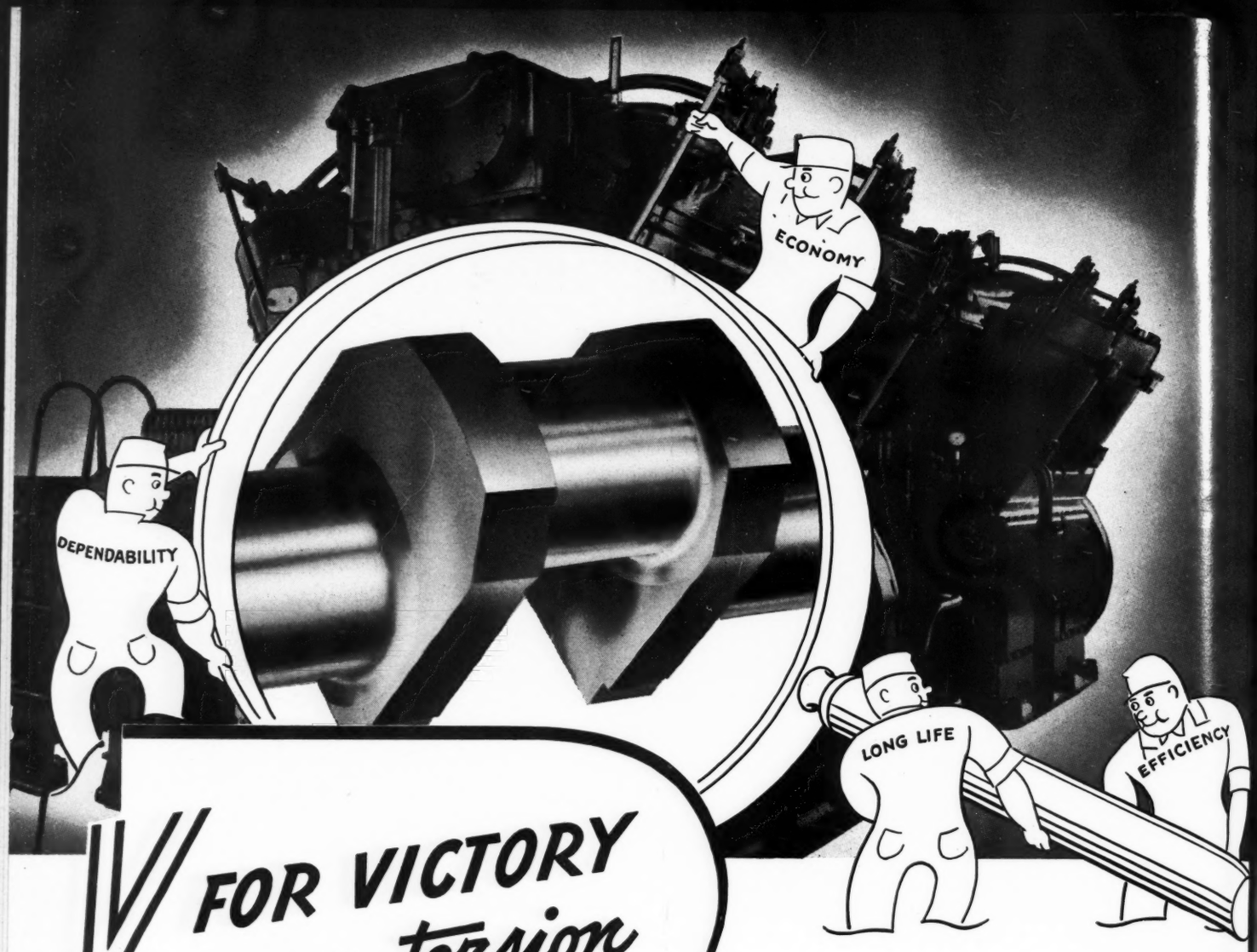

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GAS

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Eighteenth Year of Publication

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GUEST EDITORIAL

Let's Not Lose Our Compass

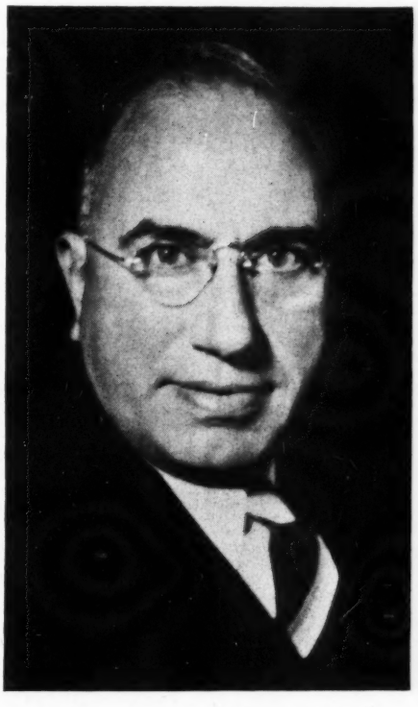
By J. FRENCH ROBINSON

Chairman, Natural Gas Section, American Gas Association
President, The East Ohio Gas Co., Cleveland, Ohio

MY THANKS are due the editor of this magazine for having asked me to write the "guest editorial." It is a grand idea, anyway, quite regardless of the editorial's merits. The purpose of editorials, as I understand it, is to tell other people how to do things. Here is a reversal of the usual formula. We can tell ourselves what to do. I wish this guest editorial idea would spread. There are many publications throughout the land that we all wish we could visit editorially as their guests—and stay a long, long time.

To carry out the idea literally, would it be correct for the guest editorial writer to tell the real editors, his hosts, what he would like to have them do? Maybe, though, you're only company, after all, and while visiting must do as the family does. So here I will have to sermonize in orthodox editorial fashion. But it must be admitted that the foregoing extension of the "guest" editorial would have possibilities.

More seriously, our own industry and all the others might be better off for a little preaching to. We can take counsel with each other. And again to take advantage of the editorial, or sermon in type, idea it might very profitably take the form of telling ourselves some things we need to be told—but don't like particularly well to be told.



First of all, of course, comes our share in the war. There is a war, and we are in it to win because we have to win it. Speculation as to how this is ultimately to be done is quite useless on my part and yours. All we do know can be put in two short sentences. We are going to preserve this country and the free institutions which made it possible and which are now endangered by war. We are going to do our part, as an industry and as gas companies, in war production.

To chart this last would take a book; it would be reportorial anyway. On top of that, we all know it, and this is an editorial—not a news chronicle. To use words in stepping up the spirit which we put into our war effort would be a waste of words, and an injustice to our industry, as well. Our war spirit is fine, thank you.

How companies are managed and maintained through these times of stress and uncertainty is of the very first importance, both for maximum war effort and to preserve their place in the nation's free political and social economy which are in jeopardy. I submit that the study of our country and its institutions is as much a responsibility of the men and women engaged in industry right now as anything else we do. For it is as much a part of the country's war effort to know what it is fighting for as to be told how to do the fighting and to get the fighting done.

The direction we are going determines the destination at which we arrive. We can and must know the direction, whether it be possible to control it entirely, or not.

War is a harsh teacher and conducts a rough school. But the learning is very thorough. The public is being taught, in big, easy-to-read letters, its vital dependence on the kind of an industrial development that only free institutions and an American system of free enterprise can produce. If it is cynically and shallowly suggested that Germany and Japan were able to put together a formidable military machine without the ingredients of individual incentive and personal initiative, in their social formulas, the answer which we fire back instantly is: "We don't want that kind. It is to prevent that kind of social and economic order that this shooting is all about."

On the other hand, if the public has gone to an industrial school for the war, it is equally true that industry and business have gone to a school of popular government and are learning its principles and functionings. It is all a wholesome and helpful outgrowth of this war. Business and industry have found the true meaning of "political" as it actually operates in a political economy. It is no longer only a word for school text books or a loosely used term of reproach. Governments really are political, as the word is correctly use. It is well that they are, and the salvation of democracy that they are. Industry is functioning through political government and is still keeping its independence; political government is geared in with free industrial enterprise. Both are learning a lot, with mutual advantage.

We are going places with our government and our government is going places with us. Now, let us keep our eye on the chart and not lose our compass. And go! If we do that we won't need to worry about where we turn up afterward, or find out that carelessness in the way we went about preserving America may cost us that which we are out to save.

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M. B. SKINNER CO. *Est. 1898* SOUTH BEND, IND., U. S. A.

THERMALLY THINKING

Harold L. Ickes

THE place of honor on the schedule of the Annual Natural Gas Convention in New Orleans this month goes to the Secretary of the Interior and Petroleum Coordinator for National Defense, Harold L. Ickes. Secretary Ickes will be the principal speaker at the Gas Industry Dinner on May 6th, and his remarks will be heard not only by the assembled gas and oil industry executives, but, in all probability, by a large audience of the public over the radio.

The entire natural gas industry is fully aware and deeply appreciative of the distinction that is reflected on its deliberations by the presence of a member of the President's War Cabinet. Since the multifarious demands on his time and energy are already such as to tax human capacity it must be concluded that his very presence in New Orleans is in itself an indication that a message of far-reaching significance is to be there personally presented.

We have had no preview of the distinguished speaker's notes, nor would we undertake to forecast what he may or should have to say. But his reputation for speaking straight from the shoulder has preceded him, and we anticipate that his May 6th address will be in no sense a departure from his established custom of presenting the simple and sometimes disagreeable facts in plain and unequivocal language.

Whether his message to the industry shall be regarded as bad news, or good, will depend in a large measure not on what he has to say, but on what his audience is prepared to hear. We believe that the natural gas industry as a whole is prepared to take any new steps that are necessary for the preservation of this nation, and that its entire personnel awaits only the word to evoke even greater contributions to the national welfare.

This being true, the natural gas industry stands ready for the new orders of the day that will set it marching toward the goal of the triumphant and honorable peace that all true Americans envision, mindful of the fact that there await the still greater contributions that only that peace can make possible.

Differ though we may with the Secretary of the Interior in questions of peace time social policy, there can be no division of opinion on the question of complete and self sacrificing subjugation of both political and personal ambitions to the central goal of Victory.

We salute the Honorable Harold L. Ickes as the supreme commander of all of the mobilized divisions of the fuel industries. Natural gas is ready and eager for its next great assignment.

■ ■

Conserve

THE gas industry as a whole may well congratulate itself on the fact that it has come through the first winter of the war without any serious interruptions of service either to residential or to industrial users of its fuel. New demands have taxed facilities to the utmost, in a few instances, and in one area there was for a time a serious danger of an actual shortage of natural gas.

But now is the time, not for resting on the accomplishments of the past winter, but for preparing to meet the new problems that will become increasingly pressing, and will reach their climax in the winter of 1942-43.

If it be true as is now commonly said, that industry is producing at less than 50% of capacity in war materials, it is inevitable that that additional 50% now so sorely needed by our fighting forces will be pressed into early service. As factories and plants go from the single to the double, and soon to the three shift day, the demands for fuel will be commensurate with the increased output of this trebled activity. Where gas is already being used, the demand will be for more and more gas, and nothing short of actual delivery will be accepted.

So-called interruptible or dump load contracts are gradually ceasing to have any meaning, for the simple reason that where war production is concerned interruptions cannot be considered. It is obvious that in the main domestic users of gas will be the ones who will be called upon to make whatever sacrifices are necessary to keep the production of war materials amply fueled.

We believe that during the summer of 1942 the entire gas industry should recognize the situation that threatens for 1943, and should take on itself the obligation of forewarning consumers where there exists even a reasonable possibility of a gas shortage in the future. The choice lies between the industry undertaking the campaign, ostensibly of its own volition, or having it introduced in obedience to an official order out of Washington.

We submit that by and large the 18 million or more families in the United States using gas as a fuel can be more effectively reached and their cooperation enlisted through the agencies of their own gas companies than by any other means. Through the medium of the home service departments there exists an already established entree to the great majority of the gas-using homes of the country. The home service representatives have done an outstanding job in establishing and maintaining the good will of American housewives. And because their work in the main has been tuned to the customers' requirements, rather than to the utilities' particular interests, they have gained a measure of confidence on the part of their clientele that is the frank envy of other industries.

Now home service representatives must be trained with more than the conventional kit of information on how to make gas equipment last, or how to use the fuel most efficiently. They must be supplied with the data that will enable them to flatly tell their contacts how they can use *less* gas, and in the telling they must be backed up by the official attitude of the managements that they represent. Given that backing, they will be in a position to make their own great contribution, not only to the good of the gas industry, but to the safety and welfare of the entire nation.

National Advertising

THIS month the American Gas Association shifts the accent of its national advertising campaign and places the industry on a war footing squarely behind the government's nutrition program. First advertisement of the new series which is to appear in a number of leading national magazines this month, will feature the government's official rules for a nutritive diet under the slogan, "U. S. need US strong . . . eat nutritional foods."

Since 85,000,000 Americans rely upon gas for cooking, it is only natural that the gas industry should become the leader in this effort to improve the health and strength of the people. This campaign should accomplish two things: (1) and most important, better enable the American people to take the offensive in seeing this fight through to Victory; (2) establish as automatic food purchasing and preparation habits that will build and maintain the health, strength, and morale of the people to win the peace that must eventually come.

The gas industry may well be proud of serving a fuel that is playing such an essential role in this great constructive work. Through its national advertising the industry is spreading the gospel of nutritious meals prepared on a modern gas range. Through the tie-in advertisements of the local utilities and through the specific efforts of the sales force and the home service workers, this message of cooking for health is being carried directly to the housewife, who after all must do the actual job, and who has, in no uncertain terms, expressed her desire to do it on a modern gas range.

While discussing the subject of national advertising, it might be well to report again on that campaign which is currently being sponsored by a group of electric and combination gas and electric utilities.

In the February issue of *GAS* (page 17) there appeared a note to the effect that a group of 54 such companies had individually appointed N. W. Ayer & Sons, Inc., eastern advertising agency, to conduct a national campaign in five weekly publications. Purpose of the campaign was to tell the American people what the local electric companies are doing in the way of aiding in the war effort and what they do for the safety, convenience, and comfort of the public. The first advertisement appeared in December, 1941.

The latest advertisement in the series was noted in *Life* (April 6, p. 5) and in *Time* (April 13, p. 45). The *Life* advertisement was sponsored by 57 electric utilities, the *Time* insertion by 64 companies, which may be an indication of the increasing support that is being given the campaign.

The April advertisement starts off, "Gee Whiz, Mr. Jessup, a double decker," which means nothing until one reads the squib of copy below which emphasizes "the fact that the average price of household electricity is only about half of what it was 15 years ago." The copy of course closes with a comment on what the electric utility industry is doing today in "turning the wheels that turn out the guns to keep America *free!*"

■ ■

No Fishing

TO STATE regulatory bodies, and to agencies of the federal government as well, we commend the decision of the Massachusetts commission in refusing during the present national crisis to conduct an investigation of the rates of the New England Telephone and Telegraph Co. "We are conscientiously alert," declares the commission, "to the dangers which would result from such an untimely investigation." It is further pointed out that the company has expended "huge sums of money in a cooperative effort to make intelligently effective plans of the U. S. Government, directed toward a successful and efficient conclusion of the war."

Fishing in troubled waters is an old pastime of political hacks, and it is a matter of grave concern to the ordinary citizens of the United States that the sport is still being pursued by many in Washington and elsewhere who might better turn their talents and their attention to strengthening the unity of the nation on which a "successful conclusion of the war" depends It is a stale bromide now to say that business has never been fully appraised of either the intention or the direction of the Administration with respect to the rights of private enterprise to continue to function, even in times of peace. Industry has watched with disgust and with patriotic misgivings the unending struggle for prominence that has gone on, and is still going on, within the ranks of those who have promised to lead us to Victory.

The Government has declared in no uncertain terms that national welfare is of paramount concern, and that individual casualties in the ranks of business cannot be made a matter of present consideration. This is as it should be, and no right-spirited American will dispute the probity of such a stand. But on the Government itself there rests a moral obligation to set its own house in order, and to impose on its own personnel the same high standards of self-sacrifice, personal restraint and freedom from bureaucratic opportunism that is required of the rank and file of ordinary citizens.

Laws and executive orders cannot be issued fast enough, nor can their scope be made broad enough, to effect by compulsion the united effort that only cooperation can achieve. Business men who have occasion to see governmental agencies in action day after day, to see the jockeying for position that goes on within and between departments, and to glimpse the bland devotion to pet plans that still occupies the attention of men in high places, are concerned for the welfare of our nation.

"A house divided against itself will fall," and as surely as those words were true when they were first uttered, so they are true of the United States of America in the year 1942.

■ ■

The Unfrozen Industry

LIMITATION ORDER L-79, one of Washington's latest moves in this sudden transition to a total war effort, prevents the sale and delivery of new plumbing and heating appliances used in or connected to a water, sewer, or gas system.

Naturally, this order works great hardship upon the natural, manufactured, and liquefied petroleum gas industries, and upon their manufacturers, wholesalers, retailers, and consumers. But this is war—total war—and there are now no complains, nor will there be—as long as, within the limits of Washington effort, such restrictions are placed equitably on all.

Amazingly omitted from and unaffected by the restrictions of L-79 is the electric utility business, which is, if we are to believe the billboards of one municipal unit, going full blast ahead — "Business as Usual." Yes, there are plenty of electric ranges available on nice, pleasant, easy terms.

Perhaps there is no power shortage? Perhaps no need for daylight saving? Perhaps that recent Washington dispatch which spoke of impending power shortages in New York, Philadelphia, Chicago, Los Angeles was just so much malarky? Perhaps there are metals and materials aplenty for the manufacture of electric ranges, water heaters, etc.? And for their installation, too!

Perhaps the War Production Board has just not had time enough to set up rules for the curtailment of the electric industry. In the meantime, this hardly seems a time for a great American force, which the electric industry unequivocally is, to even give the impression, over the prostrated forms of its competitors, that its plan of operation is "Business as Usual."

GAS at WAR

Washington Notes

WASHINGTON last month was especially prolific in issuing Limitation Orders affecting the manufacture, distribution and sale of goods and services to America's war-bound civilian population. Brief resumes of some of the Orders affecting the gas utilities and allied industries are:

Limitation Order L-79: In order to prevent the dissipation of existing plumbing and heating equipment stocks for non-defense building, modernization, or unnecessary replacements, the War Production Board on April 16 froze all such stocks, except for retail sales of $5 or less, or for any sale on an A-10 or better preference rating.

The order restricts the sale and delivery of all new plumbing and heating equipment, including any equipment, fixture, fitting, pipe, or accessory of a type used in or connected to a water, sewer, or gas system; or any primary heating unit or accessory designed to provide building warmth.

An interpretation of the limitations of this order received April 20 from the War Production Board states:

> "Gas cooking appliances, gas refrigerators, water heaters, oil and coal heaters, and clay and terra cotta sewer pipe may only be sold or delivered in accordance with the terms of the Order."

To date the order does not apply to such accessories or fixtures connected to electrical distribution systems.

The order does not cover used plumbing and heating equipment, or tools used for installation and repair, or hoses, sprinklers, and similar devices attached to outdoor faucets.

Any person may sell to a purchaser who certifies that the item is necessary for the installation of specifically listed farm machinery or equipment.

Disposal of inventories will be accomplished through the placing of preference-rated orders with manufacturers, dealers, and others. The Plumbing Branch hopes that retailers will sell a large percentage of their inventories of new equipment back to manufacturers and distributors. A rationing system for existing supplies is not contemplated at present.

Any person may apply for relief from the restrictions of the order by setting forth the pertinent facts and reasons why he considers he is entitled to relief and addressing it to the Director of Industry Operations, War Production Board, Washington, D. C.

L-79 and Gas Refrigeration: An interpretation by Geo. S. Jones, Jr., vice president and general sales manager of Servel, Inc., clarifies to some extent the conflict between Limitation Order L-79, which prevents the sale and delivery of gas refrigerators and Limitation Order L-5-b, under which gas refrigerators in the amount of one-twelfth of last year's retail sales, or 100, which figure was the greater, in the hands of retail outlets on February 14, may be sold.

While in Washington, Mr. Jones took up points of conflict with Mr. Brundage of the Plumbing and Heating Branch and with Mr. Hammersley of the Consumer Durable Branch, which handles household refrigerators. It is Mr. Jones' interpretation that an amendment will be immediately issued, specifically eliminating gas refrigerators from the restrictions of L-79. He further interprets that the sale of gas refrigerators may be continued without reference to L-79, in anticipation of the amendment.

Preference Rating Order P-84 (Plumbing and Heating Emergency Repairs). This order, issued in March by the War Production Board, assigns a preference rating of A-10 for the replacement in kind of heating equipment which is worn out, damaged beyond repair or destroyed.

Limitation Order L-31: J. A. Krug, Chief, Power Branch, War Production Board, in a letter dated April 13, to Carl A. Swigart, Trade Relations Representative, Pacific Coast Gas Association, rendered the following official interpretation covering this order.

> "1. Deliveries of gas may be made for the operation of heating equipment which is moved from a location where it has been receiving deliveries to a new location, even though this new location is a building whose foundations were not completed prior to March 1, 1942.
>
> "2. Paragraph (e) prohibits deliveries of gas for the operation of space heating equipment or heating equipment supplying the major portion of the heating requirements of the premises. 'Central space heating equipment' is defined as heating equipment intended by reason of its size, type, or location to heat more than one room. The floor furnace referred to in your question would seem to come within the category 'central space heating equipment' and hence, would not be eligible to receive deliveries of gas. Because of the difficulty involved in policing the Order, it has been determined that deliveries of gas cannot be made for the operation of equipment, deliveries to which would ordinarily be subject to paragraph (e) of the Order, even though this equipment is controlled or regulated to consume less than its normal quantity of gas.
>
> "3. Paragraph (e) of Limitation Order L-31 merely prohibits deliveries of gas for the operation of certain types of space heating equipment. The Order does not prohibit the installation of any equipment."

Limitation Order L-22: The Director of Industry Operations, War Production Board, on April 11 issued this Order which limits the amount of iron and/or steel to be used in the manufacture or assembly of furnaces to percentages of these metals, as measured by total weight, used during the calendar year 1940.

Class A manufacturers, those who made 8,000 or more furnaces in 1940, are restricted to 50% of the total weight of iron and/or steel used in 1940. Class B manufacturers, those making less than 8,000 furnaces in 1940, are restricted to a use of 90% of the total weight of these metals used in 1940.

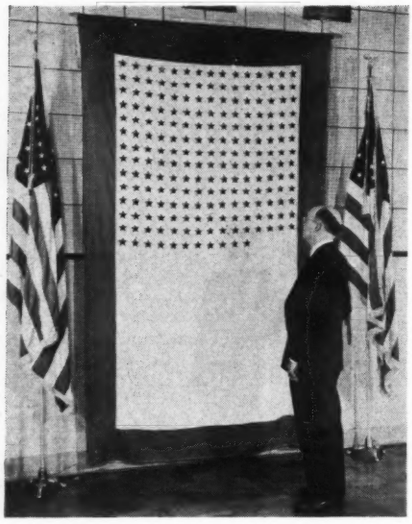
"Furnace" means any direct-fired, central plant, warm air heating unit which is designed for the purpose of heating the interior of a building: Provided, that "furnace" does not include any air heating device commonly known as a space heater or floor furnace (whether portable or fixed).

Limitation Order L-30: Under this consumption of iron and steel used in the manufacture of cooking utensils during the second quarter of 1942 is cut to 90% of the weight of metal consumption for the calendar year ending June 30, 1941.

Limitation Order L-86: Issued April 8 by the War Production Board virtually freezes the liquefied petroleum gas industry at its present status.

The order forbids new installations of equipment to contain, distribute, or dispense liquefied petroleum gas, except facilities used in transportation and refining. Use of preference ratings under the Petroleum Order, P-98, and the Utilities Order, P-48, for operations affected by Limitation Order 86, is specifically forbidden.

L-86 does not apply to material for



Franklin S. Wade, president of the Southern California Gas Co., Los Angeles, stands before the company service flag, which hangs in the foyer of the main office. On the flag are 206 stars, although by April's end 228 company employees were in the service. There is one gold star—Aviation Lieutenant Russell M. Smith, the fourth employee to join the service, who was killed in action somewhere in the Pacific.

maintenance and repair of existing equipment or to exchange of containers on the premises of any person in the normal course of distribution of liquefied petroleum gas. Installations begun before January 14, 1942, are allowed but must be completed on or before May 15. Exceptions to the order may also be made in special cases by the Director of Industry Operations upon application in accordance with Form PD-397.

P-100, General Maintenance, Repairs and Operating Supplies Order: Durable office equipment may not be ordered with preference ratings assigned under this order, according to an interpretation of the order issued March 23 by the Director of Industry Operations. The interpretation specifically excludes typewriters, adding machines and other business machines, desks, filing cabinets and similar items of durable office equipment from the definition of operating supplies for which the A-10 rating assigned by the order may be applied.

Conservation Order M-43-a: This order, as amended March 17 by the War Production Board, provides that after May 1 the tin content of solder by weight is reduced to 30%.

Since solder is essential in the repair of gas meters, gas companies, both before and since the issuance of the order, have been experimenting in the use of substitutes for tin content; for example, silver.

The greater portion of the tin available before the war, to the countries now constituting the United Nations, has been reduced by more than two-thirds. Contacts in Washington indicate little hope for a modification of this restriction.

In some States, applications have already been filed with regulatory commissions for modification or suspension during the war emergency of regulations that meters must be recalled at specified intervals for examination. In one state, Commission approval has been granted. WPB officials say informally that meters in service might well be left untouched until the war is over.

Conservation Order M-68: The new procedure for filing applications for exceptions under this order is as follows: Three copies of the application should be sent directly to the Director of Production, Office of Petroleum Coordinator, New Interior Building, Washington, D. C. A fourth copy of the application should be mailed or delivered to the OPC District Office for the district in which the lease, pool, or plant is located.

This procedure applies to all three application forms for exceptions under M-68. Form 214-a is used by operators applying for an exception for an entire pool or drilling program; form 214-b for an exception for an individual lease, property or well; and form 214-c for an exception for a cycling plant or a repressuring plant.

■ ■

Conservation of Materials

Last summer the Office of Production Management recognized the necessity of conservation of materials vital to the defense program and set up an official Bureau of Industrial Conservation. The importance of scrap materials is becoming more obvious as production statistics become available. During 1941, 50% of all steel produced came from scrap, 33.3% of the copper, 33% of the zinc, 20% of the lead and 16.6% of the rubber. This was during a year when only 21% of our total production was engaged in defense operations. It is an impressive picture of the value of scrap in industry.

The Industrial Salvage Section has been assigned the job of advising industry on salvage and reclamation problems and to expedite the flow of both normal and dormant scrap through normal channels into the flow of materials needed for defense.

WPB's Salvage and Scrap Program: The cooperation of 170 trade associations and 30,000 industrial plants is "Speeding Up" the flow of dormant scrap and obsolete equipment to be converted into war materials. A four-fold fundamental plan, with variations in detail to suit local conditions, has been sent to gas utility executives. The plan is:

(1) Put some one individual in charge of salvage in every department of your business and give him authority to act now.

(2) Devise an effective method of bringing the message of conservation to *all* of your employees.

(3) Build into your program a plan to keep it alive. Don't let initial enthusiasm die.

(4) Report periodically the amount of scrap materials you have released, stating quantity, kind and name of dealer to whom sold.

The East Ohio Gas Co., Cleveland, Ohio: J. French Robinson, president, has made the following report to George T. Weymouth, chief, Industrial Salvage Section, Bureau of Industrial Conservation, WPB, Washington, D. C.:

"We have made a survey of our plants for potential scrap under the direction of G. W. Hersley, general superintendent.

"The result of the survey amounted to 450 tons of scrap metals, which will be disposed of as follows: April—330 tons. May—120 tons.

"In the first three months of 1942 we have disposed of 490 tons of scrap metal and will recover through our repair program approximately 50 tons

Clifford E. Paige, president, Brooklyn (N. Y.) Union Gas Co., is shown presenting six official document seals to Mrs. Harry H. Tracey, co-chairman of the Brooklyn Salvage Committee. The seals, used in past years by the Brooklyn utility, were among 56 tons of critical materials contributed by that company in Brooklyn's "Spring House-Cleaning Week" campaign.

per month for the balance of the year in addition to the amounts listed above."

The Brooklyn (N. Y.) Union Gas Co.: In an all-out campaign to release worn-out or used equipment for war uses, the Brooklyn Union Gas Co. in March donated 56 tons of iron, steel, lead, brass, paper and other critical materials. Six official document seals, the company history of which dates back to the organization of the Jamaica Gas Light Co. (formerly subsidiary of Brooklyn Union) in 1856, were a part of the Victory Scrap Pile which was collected by the Brooklyn Salvage Committee. To facilitate the prompt disposal of all scrap and the conservation of all critical materials, the Brooklyn utility early this year appointed a Conservation Officer for each of its operating departments and divisions and charged him with the responsibility for effecting a rigid economy in the materials used. Not unrelated to the conservation campaign is the company's development of recovery process for solder from meters which are to be scrapped. Although still in the experimental stage, the company reports the recovery of two pounds of solder per meter. Since solder normally consists of 50% tin and 50% lead, and tin is one of the most needed materials, this development will aid the war effort.

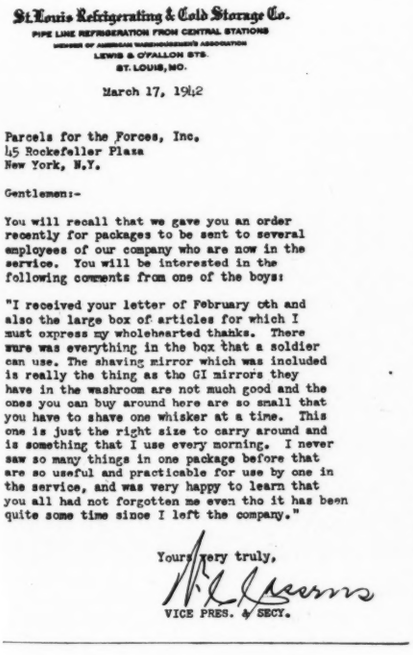
■ ■

Employee Relations

Parcels for the Forces, Inc.: A new wrinkle in good employer-employee relations has recently been developed by a service group called "Parcels For the Forces, Inc.", a New York organization which has assembled a complete list of the "extra" needs of service men, obtains the correct items into compact gift parcels which they dispatch to any part of the world.

Companies using the plan place their orders with the group and send a list of their former employees now in service. They have an assortment of gift packages from which they may choose, but the typical package includes a 1-lb. tin of cookies, a 1-lb. tin of chocolate wafers, a 1-lb. box of fruit bon-bons, a package of California figs, a tin of Deviled Ham, two decks of playing cards, a toothbrush and tooth paste, brushless shaving cream, razor blades, steel shaving mirror, talcum powder, pomade, shoe polish, and chewing gum.

Delivery of the packages to any point in the world where United States Forces serve is guaranteed by "Parcels For the Forces, Inc." Arrangements may be made to send the gift packages at stated intervals throughout the year. Address: 45 Rockefeller Plaza, New York.



St. Louis Refrigerating & Cold Storage Co.
PIPE LINE REFRIGERATION FROM CENTRAL STATIONS
MEMBER OF AMERICAN WAREHOUSEMEN'S ASSOCIATION
LEWIS & O'FALLON STS.
ST. LOUIS, MO.

March 17, 1942

Parcels for the Forces, Inc,
45 Rockefeller Plaza
New York, N.Y.

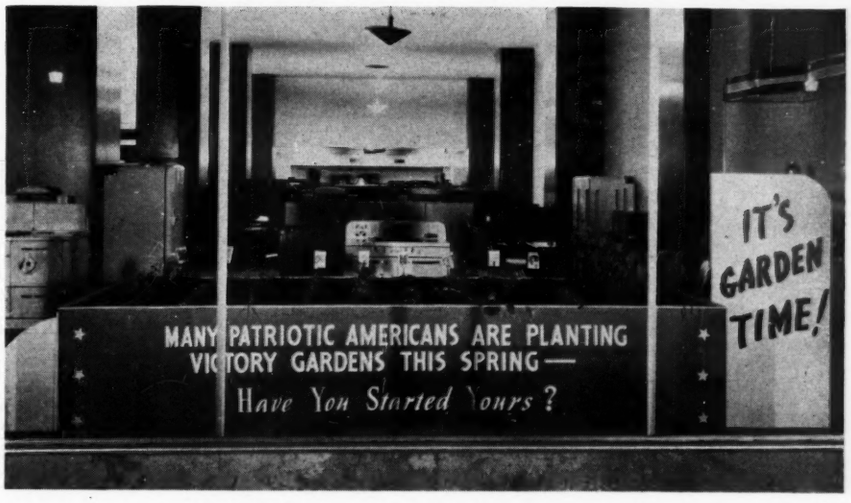
Gentlemen:-

You will recall that we gave you an order recently for packages to be sent to several employees of our company who are now in the service. You will be interested in the following comments from one of the boys:

"I received your letter of February 6th and also the large box of articles for which I must express my wholehearted thanks. There sure was everything in the box that a soldier can use. The shaving mirror which was included is really the thing as the GI mirrors they have in the washroom are not much good and the ones you can buy around here are so small that you have to shave one whisker at a time. This one is just the right size to carry around and is something that I use every morning. I never saw so many things in one package before that are so useful and practicable for use by one in the service, and was very happy to learn that you all had not forgotten me even tho it has been quite some time since I left the company."

Yours very truly,

VICE PRES. & SECY.



Patriotic pedestrians of Houston, Texas, are impressively informed that "It's Garden Time" by this growing "Victory Garden" in a United Gas Corp. show window.

Public Relations

Several unique methods of aiding, not only the drive for Victory, but the consumer as well, have been effectively put across by public relations departments of numerous gas companies. Some specific instances follow:

United Gas Corp., Houston, Texas: Uses two top-notch attention-getters in its window displays. A "Victory Garden Window" and a "Can For Victory Program" are presented to Houston pedestrians. The timely miniature victory garden and the array of colorful jars of canned vegetables bring many inquiries concerning planting, seeds, garden tools, gas ranges and pressure cookers. As the "window garden" grows—so, it seems, does the interest of passersby. (See cut.)

Mississippi Power & Light Co., Jackson, Miss.: Recently launched an unusual promotional campaign "to teach its customers how to use less gas." Following the depletion of native gas fields nearby which had caused the gas rate to increase more than 100%, a two-months survey was conducted to determine the best manner in which to cut the amount of gas used for home heating. Advertisements were slanted to stress conservation and economy and a "thrifty 7-point check list" was compiled for representatives to bring to the housewife's attention in door-to-door interviews. Local billboards also publicized the "seven thrifty checks" which, it is hoped, will cut residential gas consumption 10 to 20%. The check list follows:

(1) Check adjustments of space heater, range, and water heater.
(2) Check adjustments and efficiency of central heating plants.
(3) Check open chimneys and fireplaces.
(4) Check cracks in doors and windows, and heat loss through ceilings and floors.
(5) Check leaky hot water faucets.
(6) Check temperature for oven heat of 70° to 75° without raising windows.
(7) Check to see that rooms not requiring heat are closed off.

Pittsburgh (Pa.) Natural Gas Companies: Advertisement headline "Behind our armed forces . . . the steady flow of Natural Gas" has been adopted by the American Gas Association

MISSISSIPPI POWER & LIGHT COMPANY
DON'T WASTE GAS CHECK-UP CENTER
40 TIMELY & THRIFTY CHECKS YOU CAN MAKE IN YOUR HOME
Compare the OLD WAY with MODERN Gas WAY!

Thrifty customers are invited to learn modern methods of gas conservation at the Mississippi Power & Light Co. (Jackson, Miss.) "Check-UP-Center," where gas-saving plans are colorfully outlined.

as the slogan and copy theme for its current campaign in business and trade publications. Build around the slogan: "Natural gas is vital to war industry. Use it wisely!" the Pittsburgh long-range campaign has received the approval and commendation of the government and the natural gas industry. In March, advertisements appearing in 11 trade publications reaching seven different fields told the story of why natural gas was selected by war industries as a vital material of war, how it reflects the inherent advantages which have made gas the preferred fuel for industrial and commercial heating purposes.

Oklahoma Natural Gas Co., Tulsa, Okla.: Is showing a series of films which tell an unusual story of wartime Britain. Released through the British Ministry of Information, the four series of films are spliced together and prefaced with an attractive presentation trailer. They picturize the mobilization of the Home Guard in England; a typical British anti-aircraft crew in actual operation; British police and their wartime duties; and German raids on London. The films are being made available to civic clubs, police, fire and other municipal departments, statewide organizations, women's clubs, the American Legion, and also to numerous school systems for their educational value.

■ ■

Safety Campaign

New Orleans, La.: In a twofold campaign both to demonstrate to the public that adequate measures had been adopted and to impress the employees with the importance of following them, the New Orleans Public Service Co. arranged a window display in March that effectively stopped thousands of passersby. In the window were displayed fifty-odd items of safety equipment such as explosive meters, spark proof tools, gas detectors, heavy rubber gloves, asbestos helmets, first aid kits, construction shields and safety cap shoes. These were arranged against a semi-circular background above which was mounted cut out letters carrying the message: SAFETY, The American Way . . . as practiced by employees of New Orleans Public Service Co., Inc.

■ ■

Plant Protection

Houston, Texas: To cut down the visibility of their meter and regulator stations in case an unfriendly bomber strays their way, the Houston Natural Gas Co. has painted all such structures an olive drab. Formerly they were a bright aluminum.

Another step taken to protect the company's property from possible enemy action has been the installation of Watch Boxes at river crossings and other strategic points. These are "readibilt" houses 6x6 ft. which permit the watchmen to keep an eye on the points they are guarding in some degree of comfort. This is especially desirable in cold or disagreeable weather. Flood lights have also been installed in some places, with cyclone fences erected around particularly vulnerable locations.

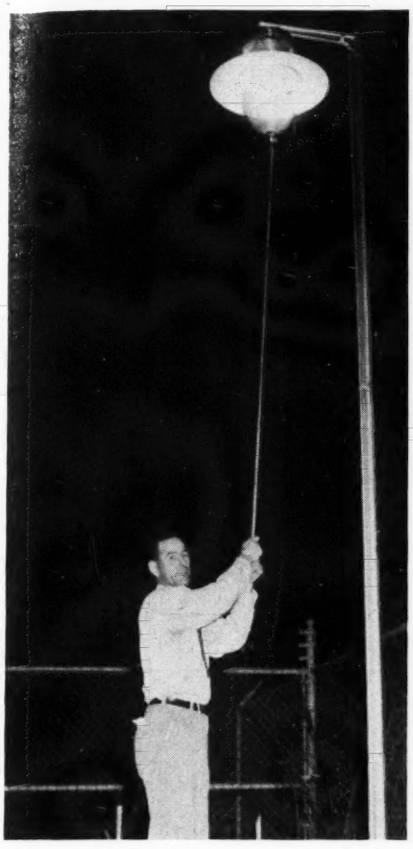
Washington, D. C.: Camouflage methods for industrial plants, factory buildings, railroad yards, air fields, routes of communication, conspicuous landmarks and transportation systems are described in the illustrated 68-page booklet titled "Protective Concealment," which has been issued by the Office of Civilian Defense.

The booklet was prepared by the War Department under the direction of the Chief of Engineers, U. S. Army. Further suggestions were contributed by the National Technological Civil Protection Committee.

San Diego, Calif.: Provision for the maintenance of emergency crews at night has been made by the San Diego Gas and Electric Co. through the simple expedient of changing the operating schedules of some employees, according to a report from D. H. Perkins, superintendent, Gas Department. Men in the meter shop rotate a nightly shift so that two additional men are always available in an emergency to assist regular sub-station operators at the principal center of distribution in the gas plant.

The gas meter shop is centrally located and these men can be easily

This New Orleans Public Service Co. window display on safety was designed to impress upon consumer and employee alike the importance of the precautions taken by the company in these days of impending danger.



H. S. Hunter, Fort Worth Division night inspector for Shop Department, lighting one of the gas yard lights. Lighting is done with torch and wrench on a long rod. Night photo by Claribel Thompson, Lone Star Gas Co.

called. Under normal conditions they continue with the regular work of the meter shop during their shifts.

Fort Worth, Texas: Lone Star Gas Co.'s Fort Worth Division is now illuminating and thus protecting its plant yards with gas lights.

Ground lights were installed only a few weeks ago and there are seven of them which are lighted each evening with a wrench fastened to the end of a long rod. An eighth light at the shop yard entrance is turned on automatically from the switch in the shop office. The switch simultaneously opens the gas valve and produces a spark which lights the gas. This particular light is 3000 candlepower. All ground lights have been equipped with an individual cutoff valve so they can be extinguished in a moment in case of a blackout or other emergency.

These ground lights are Humphrey High Candle Power Gas Lights manufactured by the General Gas Light Co. It is expected that as the demand increases for more lights around gas company and industrial plants more of these lights will be installed.

Gas lights in the buildings have been used for several years. In the prover room, where night work is particularly rushing during the spring and early summer, there are two gas wall lights, each equipped with a small pilot. All the operator needs to do is turn up the gas cock and the bright, soft light fills the room. In the shop office two gas chandeliers provide a series of four gas lights over the night inspector's desk and to illuminate the office. These are lighted manually as they are turned on.

■ ■

Building for Fire Bombs

THE HAZARD from all types* of incendiary bombs can be decreased by applying an incombustible covering over the attic or upper floor, assuming that this will act as a stopping layer for at least some of the bombs that may be used. While, without defining type and weight, nothing definite can be said relative to the penetration of these bombs, even the lighter ones would be expected to go through an ordinary wood-frame roof with the usual roof coverings and possibly also an attic or upper floor.

A covering applied to such floors would increase the resistance to penetration, besides affording protection against ignition by the bomb. The thickness to be applied need be limited only by practical considerations of cost and the weight that the construction can support. There will be progressive gain in safety with increase in thickness. A 1- to 1½-in. thickness of portland cement mortar or concrete, cast in place or as precast slabs, will prevent ignition of a wood floor from a bomb such as one of the kilogram thermite-magnesium type. Lesser thicknesses would give temporary protection, and the incombustible finish would assist materially in extinguishing or removing the bomb without ignition of the floor beneath.

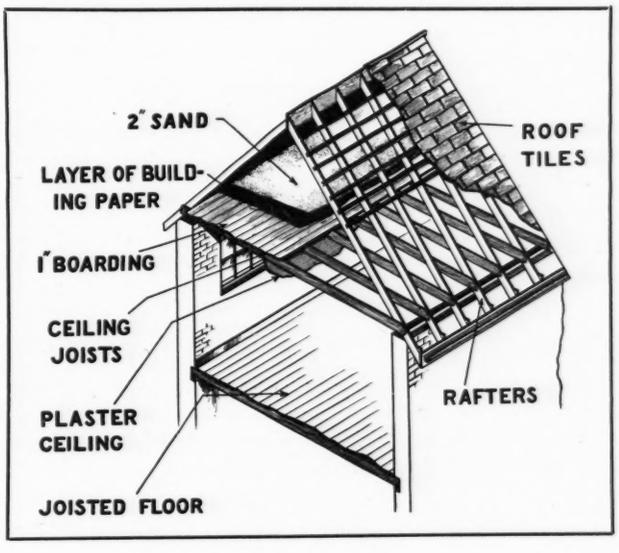
Slabs made with cinders, slag, and other light-weight aggregates are somewhat more resistive than those made with sand and gravel, although the latter do not disintegrate appreciably under the heat of the bomb. Precast slabs may require a finish consisting of portland cement mortar or magnesite to give an even wearing surface. The wearing properties of portland cement mortar can be greatly increased by the addition of emulsified asphalt in the mix. The precast slabs should preferably have beveled edges to enable the mortar to fill the joints fully, and can be nailed in place through such joints. An alternative to nailing might be to bed them in mortar. Where the traffic is light and surfaces are fairly even, it might serve the purpose to fill the joints with mortar and apply a rubber-base concrete paint in lieu of other top finish.

Slabs of burnt clay are another possibility—a development that deserves the attention of the clay-products industries. Present stock sizes in solid or near solid units of thickness from 2 in. up might be used if other considerations permit.

Where the ceiling construction has no floor above, the most practical method would probably be to floor it over with boards (not necessarily matched) on which the covering is applied.

However, the bomb is likely to ignite any combustible contents near it. As protection, the side walls and roof rafters can be covered with boards

*Reprinted from the March issue of the *Technical News Bulletin*, National Bureau of Standards, U. S. Department of Commerce, Washington, D. C.



Typical roof construction used to mitigate effect of incendiary bombs.

A. G. A. Publishes Book on Gas Industry War Protection

THE American Gas Association has just issued a loose-leaf book entitled "War Protection of the Gas Industry" to each member gas company. Additional copies may be purchased by members of the Association for $2.50. The price to non-members is $5.00.

The book, which was prepared by C. George Segeler of the A. G. A. Headquarters, is divided into two principal parts, "Protection Against Enemy Action" and "Emergency Procedures After Damage Occurs." An important part of the book is a description of the actual damage to gas company property which has been reported from English, European and other foreign sources.

Sabotage protection, air raid and artillery protection and procedures, training of personnel, cooperation with authorities, blackouts, etc., are some of the problems discussed in detail. The publication is issued under the auspices of the Committee on War Activities with the approval of the appropriate committees of the respective Association Sections.

Compiled from published literature from foreign sources, communications and memoranda from observers who have been on the scene, the book also contains contributions made by many American gas companies explaining the results of their own experimental work to determine procedures especially suited for American conditions. The loose-leaf form makes up-to-the-minute changes possible when new information becomes available. This will be sent to purchasers of the book without further charge.

made largely or wholly of incombustible materials, such as cement-asbestos boards or gypsum wallboards, or with plaster on metal or gypsum lath. Some degree of protection can also be obtained with heavy coats of sodium silicate, whitewash, borax paints, or other fire-retardant coatings applied with brush or spray. Spaces along the walls into the construction beneath should be blocked with the floor covering material or other incombustible fill.

Protections can also be applied on wood-frame flat roofs, but preferably should be not less than 3 or 4 in. thick to give the needed additional resistance to penetration required for a stopping layer in this location. The advantage within limits of using lightweight materials is apparent in decreasing the load on the structure and increasing heat insulation, particularly for ordinary temperature conditions. The protecting layer should be anchored into masonry or other exterior wall construction, and be waterproofed or otherwise covered to form a weather-tight covering. Sloping roofs require less thickness but introduce greater difficulties in application.

Between the stopping layer and any refuge room a floor equivalent in impact resistance to a single-board wood floor should intervene. This gives additional resistance to penetration and to impacts from falling materials in case of disruption of the construction under the stopping layer.

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The Home Front

Home Volunteer Movement: Stating that in this war emergency, when restrictions and the rationing of food has a definite bearing on civilian morale and the maintenance of good standards of living, the help of expert technicians in these fields is especially valuable, Servel, Inc., has announced the appointment of J. Ernestine Becker as head of its new Home Volunteer Advisory Board. Miss Becker, B.S., M.A., is Associate in Biochemistry at the School of Hygiene and Public Health, John Hopkins University, Baltimore, Md., and collaborated with Dr. E. V. McCollum in the writing of "Food, Nutrition, and Health," which is the recognized authority on these subjects.

Servel, Inc., at the suggestion of a number of gas companies, has developed the proposed program for Home Volunteer service which is intended to throw the entire strength of trained gas company employees into a campaign to show the women of the United States how to apply in their own homes the principles of conservation and nutrition recommended by the Government.

The program, as finally assembled by the Consumer Service division and the Home Economics division of Servel, presents consumer aids and materials for the execution of a complete promotional activity by gas companies.

The Home Volunteer movement gives women a practical opportunity to volunteer their services in the best interests of the country, and it gives the gas company an opportunity to render a much needed and vital service to customers by helping them to get the most out of the food and other supplies they buy, to extend the life of home equipment, furnishings and clothing and to conserve time and energy for other phases of the war effort. Each consumer who signs a consumer's pledge will receive a button and a pocket identification card. Major material in the Home Volunteer movement are the "Home Volunteer's Defense Manual" and the "Nutrition Guide and Meal Planner."

To help gas companies bring the Home Volunteer movement to the attention of their customers, the Consumer Service division of Servel has prepared and offers the following service and materials:

Newspaper Advertising: For use in local newspapers, Servel will furnish complete mat services on the Home Volunteer movement. These advertisements will be keyed for announcing the Nutrition Guide, The Home Volunteer's Defense Manual, and other materials.

Radio Advertising: Radio scripts are also being provided on the Home Volunteer movement for use in spot announcements on local stations.

Direct Mail: A gas bill enclosure has been prepared for mailing with customers' monthly statements.

Consumer Information Station Display: A colorful desk display for the Consumer Information Station in the gas company office has been prepared and is offered for immediate use.

The gas companies, who have been doing food and nutrition work for years, are considered the logical ones to step forward and give the needed assistance. They can provide the experienced personnel to explain the use and care of home appliances in the home; they have trained home economists in their home service departments versed in the science of nutrition and food. They have the demonstration rooms, the kitchens, the home appliances, all set up. The establishment of a Consumer Information Station at the utility office can show women how to do the things the government advocates, so that the women can then go home and do them themselves in their own kitchens.

Lunch Boxes: Continuing the campaign to mobilize vitamins and calories for victory on the industrial production front, Home Service committees of the A.G.A. and the gas companies have given special emphasis to the contents of the once humble lunch box. With 24-hour shifts becoming more common this aspect of nutritional work is most important, since breakfasts and dinners as well as lunches are now being eaten on the job.

Among the many releases published on this subject are those from the A.G.A., and the Bureau of Home Economics, United States Department of Agriculture.

Home Service Departments: That Home Service departments have important work to do despite the ban on sales of gas appliances is amply proved by a recent survey conducted by the Home Service Committee of the A.G.A. Many of the replies to the

question: "Do you intend to keep your Home Service Department functioning when you no longer have appliances to sell?" stressed the point that more than ever during the time when no appliances were available it was necessary to keep the public sold on the idea that gas is the ideal fuel. One pertinent comment reminded the industry that girls now in high school would later become the wives and mothers of the post-war years, and as the wives and mothers would dictate the buying policies of their own families when peace had returned.

Conservation Booklet: Not only tires but kitchen appliances and utensils must also be conserved if the average American family is to keep operating as an efficient unit in the drive for victory. So that the public may be informed on the best methods of cleaning and preserving their gas ranges for the duration, the Home Service Committee of the A.G.A. has recently issued a booklet of instructions. The price is 10¢. In addition to helpful hints on keeping the gas range in good repair, additional information on how to cook on the top burners, in the broiler and in the oven most effectively is included, together with hints on how to get the best service from gas refrigerators and water heaters.

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Employee Training

Brooklyn, N. Y.: Working on the theory that one good demonstration is worth a thousand lectures, The Brooklyn Union Gas Co. has been using real incendiary bombs in their instruction sessions for air raid directors at Greenpoint, Citizens, Gas Service, Jamaica Shop, East New York and Flatbush. Charles D. Berkebile and Castle Moore set off the bombs and then showed the men how to deal with them, using either sand or water. Following this demonstration, other bombs were set off and the air raid students were given the opportunity to extinguish and remove them.

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Foreign Note

London, England: As a preview of what we may yet come to in this country, the March advertisement of Ministry of Food in England has more than an academic interest at this time. In a two column 11-in. space, the copy purports to express the reactions of a certain Mrs. Merry to the American pork-sausage, a can of which she is holding in her hands. She recommends it for making meat pies and pasties, and comments that she and her husband would like to say thank you to someone. The copy concludes with a few words by the Ministry of Food in which it expresses the gratefulness of the English to their American allies who have spared them this pork meat, and to the brave seamen who have brought it across the ocean. Recipes are included in the advertisement for making filets of pork and pork pies.

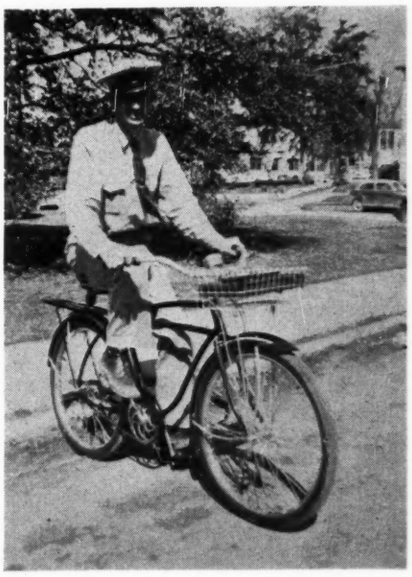
■ ■

Rubber Conservation

Akron, Ohio: Too often in the search for solutions to small problems made large by unexpected emergencies the obvious and fundamental correctives are passed over in favor of elaborate panaceas. In dealing with the subject of "How to Get the Most Service Out of Industrial Rubber Products," the B. F. Goodrich Co., Akron, Ohio, has avoided this common mistake.

Their series of six vest pocket sized pamphlets covering the maintenance of transmission belting, conveyor belts, V-belt drives, belt salvage, rubber hose, and mats and matting briefly summarize the points of sensible operating practice in simple non-technical language that the men in the shop can readily comprehend. Copies may be obtained free by writing the company.

Brenham, Texas: Under the catchy heading: "A Bicycle Built for *Tools*," the Texas Southwestern Gas Co. of the Southern Union Gas System reports in its house organ that when the government set up its program for the conservation of material, H. C. Frizzel, South Texas District Manager of the company, made an analysis and decided most of the service calls in his area could be made by bicycle. Bicycle service was instituted immediately and has proved to be very practical. According to the experience to date, it is estimated that normal truck mileage has been cut by at least 50%.



W. C. Allen of the Southern Union Gas System rides a bicycle in his daily work.

Shreveport, La.: Joining the bicycle parade is the United Gas Corp., which is trying out the plan of furnishing their meter readers, collectors and other employees who formerly used cars and small trucks to make their calls. According to K. L. Simmons, vice president, the employees have no objection to riding bicycles, particularly since they realize they are making a direct contribution to the national effort to save rubber and gasoline for military purposes.

Alva, Okla.: (Report from W. L. Woodward, president of Zenith Gas System, Inc., and president, Oklahoma Utilities Association.) Each gas utility company in Oklahoma has just a little different operating method in connection with the conservation of rubber and other valuable material for the government. All of the companies are rearranging their meter and service work so as to transport more men in fewer cars. Schedules for changing charts, regulators, etc., have been rearranged so as to require the least amount of driving.

In our particular company, where we capitalize on free adjustments and other types of free service work, we are giving consideration to making these service calls only once or twice a day. This will let them accumulate and while we are in one area, we might make several calls. In the past we have been answering service calls immediately. Sometimes this means going to the same block but a different consumer twice in the same day. By making the trips once or twice a day, this will save at least one trip.

Conservation Contest: Capitalizing on the average American's love of competition, one gas company has recently set up a contest for its drivers in which economy in oil, gasoline, and tire consumption is the basis of scoring. At the start, the average of each driver's weekly consumption was used as a base and his increase or decrease in succeeding weeks was noted on a bar chart posted on the bulletin board. Base consumption was marked off in red, and subsequent amounts used were marked off in blue extensions. The contest yielded two valuable results. First, there was a considerable saving in gasoline and oil. Second, the good driving habits developed by the drivers in an attempt to make a good showing in the contest remained after its conclusion.

The Natural Gas Industry at War

By E. H. POE

Secretary, Natural Gas Section, American Gas Association, New York, N. Y.

VICTORY in this all-out war effort will depend on many things. It will depend strongly on the genius of American management and industry's ability to produce astronomical quantities of war materials. Victory is on the assembly lines, the backbone of our strength. Victory will be produced from our abundant natural resources, conceived and contrived in many laboratories, designed in thousands of offices, built in thousands of factories with millions of efficient, precision-tested machines. The service the natural gas industry renders touches myriad segments of these operations and helps make miracles of speed a daily reality.

Victory will depend on civilian workers sacrificing long hours in line of duty. It will depend on the harmonious integration of our people and their unshakable courage and morale. Victory will be won by the youth of the nation, well equipped, well trained, well fed.

Under the present-day standards of warfare, manpower must be augmented by mechanized fighting power. To attain this end, industry has mustered the total energies of all productive agencies with a grim determination that presages no good for those at whom American guns are aimed.

Natural gas, a vital commodity in America's productive system, is playing its part on many fronts. The all-out element has placed increased importance on our product not only as a force behind industry and an essential in many chemical processes, but as a necessary service in more than seven and a half million American homes.

The progress of the natural gas industry has been meteor-like. The era existent between World War I and the Pearl Harbor incident saw what was a little-regarded industry "start coming" and with phenomenal rapidity climb to its present proportions—an industry in which $2,458,184,000 of capital is invested.

It has been our custom, over a period of the last several years, to utilize this space to demonstrate the size and scope of our industry and review the activities, from a statistical point of view, of the previous year. In the face of war, however, let us view the figures discussed as indicative of the vitality which the natural gas industry has enthusiastically thrown behind the country's victory program.

The total natural gas produced during 1941 amounted, approximately, to 3,000,000,000,000 cu. ft. This included amounts used in the manufacture of carbon black and for field purposes.

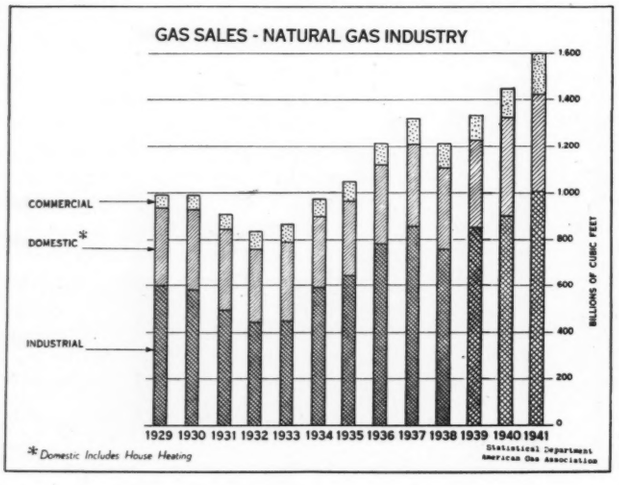
Natural gas service is available in towns and cities with an aggregate population in excess of 36,000,000. The 8,194,500 customers connected to the mains consumed 1,610,704,300,000 cu. ft. of gas, for which they paid $527,175,400. Detailed figures showing customers, sales and revenue by classes appear in Table No. 1.

It is interesting to note that the 17.3% increase in industrial sales represents an actual increase of 121,747,700,000 cu. ft. over that reported during 1940. On the basis of residential sales recorded during 1941, the *increase* in industrial sales would furnish enough gas to supply approximately 2,171,000 homes in natural gas territory with their total gas needs.

In order to maintain the high degree of service to which customers have become accustomed, 195,100 miles of natural gas pipe line are utilized. Breaking this figure down, 87,900 miles are classified as "transmission and gathering" and the remaining 107,200 miles as "distribution." (See Table No. 2.)

The services of a force numbering 69,500 employees are paid an aggregate wage of $112,449,000. The efforts of the natural gas industry to bring about better working and living conditions is evidenced by comparing these figures with the year 1929. Today the average worker receives $4.37 more and works nine hours a week less than he did during 1929.

The new business transfusion resulting from the war effort will probably make the year 1942 look like a boom year in the natural gas industry. The new records that may be established will not create illusions of permanently increased business or blind the industry to the fact that there is another distant day when it must be fortified with the morale, the strength and the financial stamina to resume normal operations. Accordingly, the industry is keeping a watchful eye on the "life boat" of the business—its normal customers. It will not falter in service to



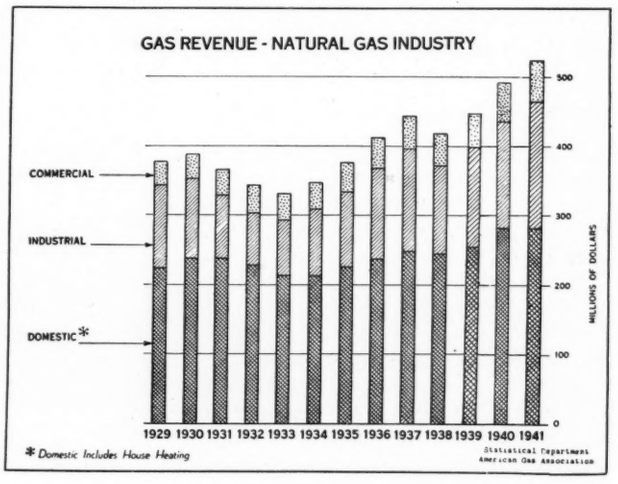


TABLE NO. 1. NATURAL GAS INDUSTRY CUSTOMERS' SALES AND REVENUE (1941)

	1941	1940	Per Cent Change
CUSTOMERS			
Domestic (Incl. House Heating)	7,566,000	7,193,800	+ 5.2
Commercial	579,200	563,500	+ 2.8
Industrial	46,600	44,400	+ 5.0
Miscellaneous	2,700	2,400	....
Total	8,194,500	7,804,100	+ 5.0
GAS SALES (M c.f.)			
Domestic (Incl. House Heating)	424,301,700	421,627,000	+ 0.6
Commercial	130,774,800	123,178,000	+ 6.2
Industrial	824,509,700	702,762,000	+17.3
Electric Generation	202,989,700	182,948,000	+11.0
Total Ind. and Elec. Generation	1,027,499,400	885,710,000	+16.0
Miscellaneous	28,128,400	18,438,000	....
Total	1,610,704,300	1,448,953,000	+11.2
REVENUE (Dollars)			
Domestic (Incl. House Heating)	285,129,200	283,717,000	+ 0.5
Commercial	58,152,200	56,058,000	+ 3.7
Industrial and Elec. Generation	180,058,700	151,412,000	+18.9
Miscellaneous	3,835,300	2,758,000	....
Total	527,175,400	493,945,000	+ 6.7

Statistical Department, American Gas Association.

them in so far as the emergency will permit.

There will, no doubt, be some dislocations in the natural gas business during the war and possible loss of some of the ground gained in the past two decades. There may be further limitations of service to some of our customers in order that the accelerated war production schedules may be maintained.

The acceptance of natural gas as a domestic and commercial fuel in areas where it is available is unquestioned. As an adjunct to many chemical processes it is well recognized. As the most desirable industrial fuel—the figures shown in Table No. 1 above speak for themselves.

The war and the scope of the tasks confronting the industry have created no timorous attitude in the industry. Its members have a persistent, idealistic faith in the industry and the nation that has nourished it and are determined to transcend all previous efforts to bring a victorious end to World War II in the shortest time possible. We can be proud that the natural gas industry is making a valiant and an honorable contribution toward that ultimate victory.

A. G. A. Revises National Advertising

FOR several months the A.G.A. has been considering the question of how to radically revise the industry's national advertising campaign so that it will be based on the realities of a war situation. Gas is making an important contribution to the nation's war effort. This activity must be dramatized in such a way that public acceptance of gas as the best fuel for domestic purposes will still be potent after the war.

Now a new series of advertisements is ready for release that will tie in with the United States Government's current campaign on nutrition. The first insertion will appear in *Life* magazine in the May 4 issue, and in the May issues of various women's magazines. Full page, four-color insertions will be used in the campaign.

The initial advertisement features the Government's official nutrition food rules and bears prominently displayed the Government's message that "U. S. needs *US* strong . . . Eat nutritional food." Addressed "to the 85,000,000 Americans who rely on gas for cooking," this advertisement points out that "your gas company suggests three ways to get best results at lowest cost with your 'Victory Cooking'." The reader is then urged to plan meals for maximum nutrition, to take advantage of the cooking and economy features of gas ranges and to buy food carefully, cook it properly and to waste nothing.

A second advertisement scheduled for national magazines in June features vegetables and victory cooking and ties in with the balanced diet recommended by the Government. Both advertisements have been approved by the Office of Defense Health and Welfare Services, Paul V. McNutt, director.

The association's advertising committee has received the congratulations of Mr. McNutt, who praised the gas industry for "its public spirited attitude in devoting its national advertising to the furtherance of the Government's nutrition program."

The gas industry is particularly well organized and equipped to further nutrition as an essential war activity. Already 1500 home service consultants employed by gas companies are helping homemakers choose the right foods and cook them properly. Gas company cooking demonstrations are being held from coast to coast. Millions of copies of tested recipes are being distributed annually.

The A.G.A. is reported to have received more than 1700 orders from local gas companies for newspaper tie-in advertisements which they buy and reproduce in their local newspapers to emphasize in their communities the national nutrition program.

"UNCLE SAM" wants
Your Gas Range to
LAST!
Your Gas Range is one of the most durable of cooking appliances – a reliable, economical servant. It will give you perfect performance for years if you exercise a little care in its use.
Easy-to-Follow Hints for Longer Service
HOW TO PRESERVE THE ENAMEL
1. After use wipe range enamel with soft dry cloth while range is warm . . . NOT HOT.
2. If further cleaning is necessary, wash with mild soap, rinse and dry.
3. Don't place wet dishes, bottles or glasses on top of the range.
HOW TO CARE FOR TOP BURNERS
1. Wipe burners with damp cloth after use.
2. When necessary, clean with mild soapy water, rinse and dry thoroughly.
3. If burners become clogged, clean with stiff brush. Modern range burners are non-clog.
4. Do not boil aluminum or enamel burners in soda. Cast iron burners may be boiled in a solution of one tablespoon sal soda to each three quarts of water. Wipe dry and turn upside down to drain before replacing.
HOW TO CLEAN THE BROILER
1. Remove broiler pan and grill after food has been served.
2. Allow to cool before washing.
3. Wash broiler compartment with soap and warm water.
4. If broiler is beneath oven, remove empty broiler pan when oven is in use.
HOW TO CLEAN OVEN
1. If boil-overs occur, allow oven to cool and then remove char with a good cleaner or fine steel wool.
2. Wash sides, bottom, door and racks of oven occasionally with warm water and soap.
3. Do not place oven bottom into water if it is insulated.
4. Low temperature roasting of meat reduces spattering of grease . . . minimizes oven cleaning.
Good Care Will Pay . . . Begin Today!
COMPANY NAME

Sample of newspaper advertisement used to tie in with new American Gas Association National advertising campaign emphasizing conservation of cooking equipment.

The Institute of Gas Technology Today

By HAROLD VAGTBORG

Director, Institute of Gas Technology, Chicago, Illinois

ON SEPTEMBER 22, 1941—a little more than seven months ago—actual work began at the Institute of Gas Technology. At that time four selected graduate students began their training, a faculty staff had been organized, and leading gas utility executives had outlined to the industry the purpose and operation of the Institute and the means by which it would be equipped and financially supported. (G A S, October, 1941, p. 27.) The work of organizing the Institute began to crystalize in 1940, and great credit is due the Research Institute Organization Group, a committee composed of executives from forward looking gas utilities, chairmanned by Frank C. Smith, president of the Houston Natural Gas Corp. Upon the formation of the Institute in June of 1941, Mr. Smith became chairman of the Board of Trustees. (G A S, July, 1941, p. 16.)

HAROLD VAGTBORG

The article herewith published records another step in this meteoric development of the Institute. In it Mr. Vagtborg has outlined what is happening there today, what will be happening tomorrow. Director Vagtborg received his B.S. from the University of Illinois, his M.S. from the Armour Institute of Technology. Upon completing his education, he became assistant to the president of the Armour Institute, and in 1938 was named director of the Armour Research Foundation, one of the industrial research institutes in the United States. In July of 1941, he was appointed director of the Institute of Gas Technology.—Editor.

THE Institute of Gas Technology has been in operation for somewhat over one-half year and progress can be reported on all fronts of the four major objectives for which it was founded: (1) training men for the industry; (2) research; (3) collecting and disseminating scientific information; and (4) encouraging independent research in the industry.

Educational Program: The educational program is well under way and is proceeding at an accelerated rate. The initial nuclei of both staff and students have grown.

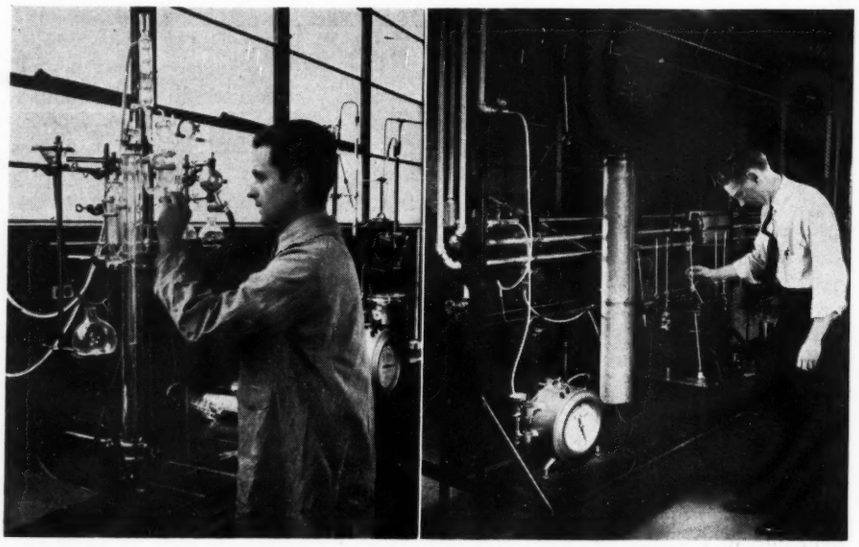
Last September four students were appointed to fellowship, and began their academic training. It was recently announced that 13 new men had been appointed to fellowship. These were selected from a group of 150 applicants and came to the Institute from colleges in all parts of the United States. Selections were made on the basis of scholarship, personality, leadership, character, and genuine interest in the gas industry as a field for development. It is interesting to note that in their undergraduate work nearly all of these boys earned from 25 to 100% of their expenses.

The students have about the same experiences in their educational work as they would at any other institution except that they are keenly aware of the support given to them by the gas industry. They intermingle with other students at "Technology Center."

Dr. Lincoln R. Thiesmeyer, Student Counselor, is largely responsible for student selection and spends a large part of his time visiting undergraduate colleges to interview students and their references. This year he will visit a large number of schools it was not possible to contact last year, and the next class will be selected from a larger number of applicants.

The Fellows at the Institute of Gas Technology will have their first contact with industry this summer when they will be employed in work at the various member companies. It is a requirement of the Institute that all of its students be employed in the gas industry for three summers during the training period. A fixed rate of compensation of $125.00 per month has been adopted by the Board of Trustees. The boys regard this summer work as a part of their education and not as a money-making venture. During the summer employment period the employee-student will be required to write a weekly report and a final summary report concerning his activities. One copy will be submitted to the president of the employing company, and one will be held strictly confidential in the files of the Institute.

Relationship of Gas Institute and Illinois Institute of Technology: "Technology Center" is comprised of three institutions, Illinois Institute of Technology, Institute of Gas Technology, and Armour Research Foundation. Although affiliated, the three are separate entities, each with its own building, personnel, and facilities. In order to give each organization the very best opportunity for service, the facilities of one are available to the other for special work.



AT LEFT: Dr. Charles H. Riesz of the research staff works with butadiene equipment. AT RIGHT: Dr. R. Lowell Hicks of the staff with equipment for adsorption research.

The quarters of the Institute of Gas Technology include offices for the faculty and research staff, library, laboratory for the students and for sponsored research projects, a chemical store and supply room, and a student class room. These facilities will be adequate for the coming year but extensions are planned for the year beginning September 1, 1943. At that time the student body will be increased by an additional 15 men, making a total of thirty-two.

With the exception of a few basic courses such as mathematics, physics, and organic chemistry which are taught by faculty members of Illinois Institute for the present time, course work is given by members of the staff of the Gas Institute.

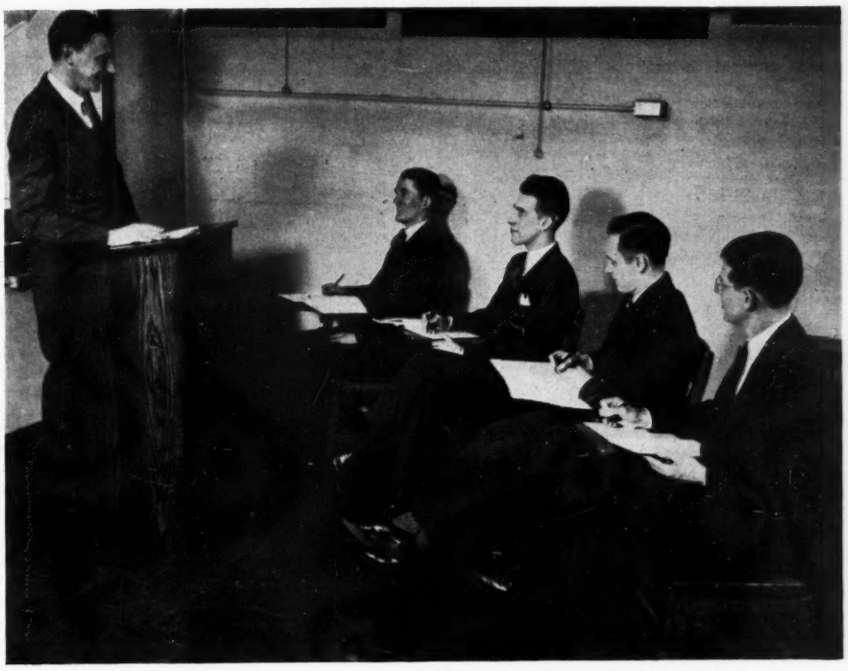
Research on Problems Basic to the Industry: Research conducted at the Institute relating to problems basic to the industry and financed from the general funds of the Institute will inevitably produce patentable developments from time to time. Results will be available only to member companies, and patents will belong to the Institute for licensing to member companies.

The results of research on basic problems will be made available to member companies. Although reports will not necessarily be issued at stated intervals, the membership will be informed immediately of any major developments. Recently the Institute issued a six-months report, and while the policy of reporting each half year may or may not be continued, it is certain that a comprehensive report will be made to the membership on an annual basis.

Several projects have had the groundwork completed and the investigation is in progress. Problems which are fundamentally significant in gas technology have been selected. The fact that these problems also have a bearing on wartime production problems is neither a fortuitous circumstance nor a sign that the national need entirely dominated the selection. Instead it is a convincing illustration of the gas industry's basic character as a producer of materials and facilities needed by all industry in peace time and by the armed forces in war.

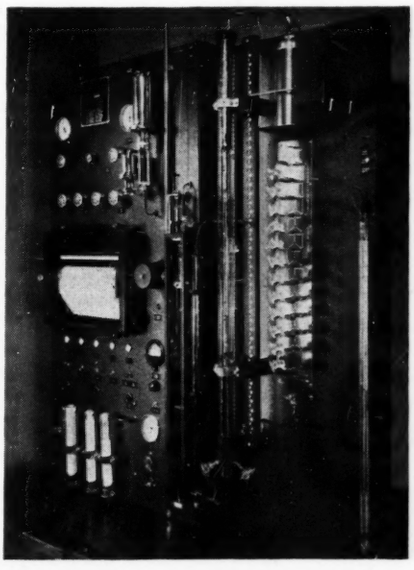
The Adsorption Group, consisting of R. C. Kintner and R. L. Hicks, is working on adsorption problems basic to the industry not only for actual operations of gas purification or separation, but also for potential uses which may be expected to grow out of systematic research.

The Catalysis Group, consisting of V. I. Komarewsky and C. H. Riesz, has already produced synthetic rubber from natural gas by a process somewhat modified from the standard, and is also working on the more important problem of conversion of hydrocarbons. Another research problem will relate to the utilization of byproducts from manufactured gas.



First Class of Gas Institute Fellows with Dr. Lincoln R. Thiesmeyer, student counselor and geologist. Thirteen newly appointed fellows have now joined this class of four.

The Engineering Group, consisting of Max Jakob, Patrick Fitz-Patrick, and a laboratory assistant, is engaged on a series of engineering problems, one of which relates to gas hydrates and their control. This group is also considering such problems as line purging of natural-gas lines and other problems of general significance throughout the natural- and manufactured-gas industries.



Podbielniak automatic recording low-temperature fractional distillation apparatus.

A gas analysis laboratory has been established and at the present time includes such apparatus as Podbielniak Hyd-Robot, Fisher analyzer, and butadiene absorption equipment. For general research work and for instructional purposes it is planned that the Institute will have in time every major type of gas analysis equipment now in use in the industry as well as new items that will be developed for special work. From this point new designs can be developed by the Institute for the benefit of the member companies.

Sponsored Research Projects: Another of the objectives of the Institute of Gas Technology is to provide the gas industry with a central industrial research organization which can undertake research projects financed and sponsored by individual companies or groups of companies. This research may be fundamental or applied in nature, but it is the logical expectation that the latter will receive by far the greater emphasis.

As the sponsoring company will pay the full cost of the research project all results and patentable developments will be available solely to it.

The Institute expects to encourage and supplement pertinent independent

Recent News from the Institute of Gas Technology

New Staff Appointments

THREE men have been named to the staff of the Institute. The men are Dr. Julian F. Smith, Dr. Charles H. Riesz and Dr. R. Lowell Hicks. These additions bring the Institute staff to 14 persons in addition to the director.

Dr. Smith has been appointed technical librarian and editor. He has been librarian of the Hooker Scientific Library at Central College, Fayette, Mo. Dr. Smith, who holds a bachelor's degree from the University of Illinois, a master's degree from University of California and a doctor's degree from the University of Chicago, reads 13 languages.

As associate director of the Hooker Library, Dr. Smith developed extensive services in translating, abstracting, searching, and photocopying. Under his direction the Gas Institute will make similar services available to member companies.

Dr. Riesz will serve as a research associate, to work with Dr. Vasili Komarewsky on catalysis. Dr. Riesz, who was the first person to receive a doctor of philosophy degree from Armour Institute of Technology, came to the Institute from the Gulf Research and Development Co. and had previously been with the Sinclair Refining Co. and Universal Oil.

Dr. Hicks will also serve as a research assistant, working with Dr. Robert C. Kintner on adsorption. Dr. Hicks holds a doctor of philosophy degree from the University of Illinois and was formerly with the National Aniline and Chemical Co. of Buffalo, N. Y.

Donations to Library

Two important donations have been received by the library of the Institute. They are collections of gas periodicals and proceedings of gas association meetings, donated by F. W. Stone, Ashtabula, Ohio, and B. L. Sites, Chicago, Ill.

The Stone collection totals approximately 300 volumes and the collection records much of the history of gas research during the last 55 years. It includes publications by the American Gas Association, Chemical Technology, and the American Gas Light Association and affiliated groups, in addition to regular periodicals. The Sites donation includes volumes of Chemical Abstracts and the Journal of the American Chemical Society from 1911 to 1932.

Mr. Stone retired in 1941 as vice president, manager and director of the Lake Shore Gas Co., Ashtabula, Ohio. He was president of the Ohio Gas Light Association when it was the largest association of its kind in the nation. He was one of the first directors of the American Gas Instiute and editor of several gas publications. An alumnus of Illinois Institute of Technology, Mr. Sites is now with the Miehle Printing Press and Manufacturing Co., Chicago, Ill.

Sponsored Research Project

A RESEARCH project relating to the removal of organic sulphur from manufactured gas has been established the Institute of Gas Technology by the Rochester (N.Y.) Gas and Electric Corp. The sponsoring company has granted $12,000 for the program.

A five-member steering committee will direct work on the project. Representing the company on the steering committee are A. M. Beebee, R. E. Kruger and Louis Shnidman; representing the Institute are R. C. Kintner and R. L. Hicks.

Sponsored projects are a part of the research activities of the eight-months old Institute of Gas Technology, which is located at and affiliated with Illinois Institute of Technology in Chicago.

The Rochester project is one of the initial sponsored projects established at the Institute. On this type of research, all data and developments are available solely to the sponsoring company.

research in industrial and educational laboratories. The best medium of encouragement will be the Institute's own example. It is to be expected that research projects sponsored by member companies, as well as those carried on as basic problems for the entire industry, will impressively exemplify the technical and financial advantages derived from research. Several sponsored research projects are under way. Monthly reports are made on the progress of the investigations to the sponsoring companies.

Library: To assist in collecting and disseminating scientific information as well as encouraging research in industry laboratories it was believed that the service of a library would be of particular benefit. The work of accumulating this library has begun. Plans are being laid to make it also the most actively serviceable library in its field, not only for Gas Institute students and research staff, but also for member companies.

Books are being acquired by purchase as recommended by the staff, and also by contributions from persons interested in developing the library. As was recently announced, F. W. Stone, of Ashtabula, Ohio, who has served practically his entire life in the gas industry, recently donated to the Institute approximately 300 bound volumes of early gas periodicals. B. L. Sites, of the Miehle Printing Press and Manufacturing Co., Chicago, contributed an almost complete set of chemical abstracts covering the period 1911 to 1932.

The Stone collection includes publications by the American Gas Association, Chemical Technology, the American Gas Light Association, and regular periodicals, some dating back 55 years. The Sites donation includes volumes of chemical abstracts and the *Journal of the American Chemical Society* from 1911 to 1932.

The library's services comprise aid to the Gas Institute staff and students in literature and patent searching; current reviewing of literature on gas technology for the benefit of member companies; and miscellaneous bibliographical, translating, and abstracting services designed to make all publications on gas technology a living force in support of development and research.

The services of the library will operate on a more definite schedule with reviews of the literature being made regularly. These reports will be in the form of bulletins, and publication will be made immediately upon the compilation and correlation of the material. At the present time the Institute is engaged in collecting for publication scientific abstracts on the current research going on in the industry. Possibly once a year the library will issue a bulletin on the scientific work done or under way throughout the world. Member companies can write for abstracts of articles, or for books from the library, and these can be loaned for a limited period. It is the intention to use every means to make the library of maximum usefulness to member companies.

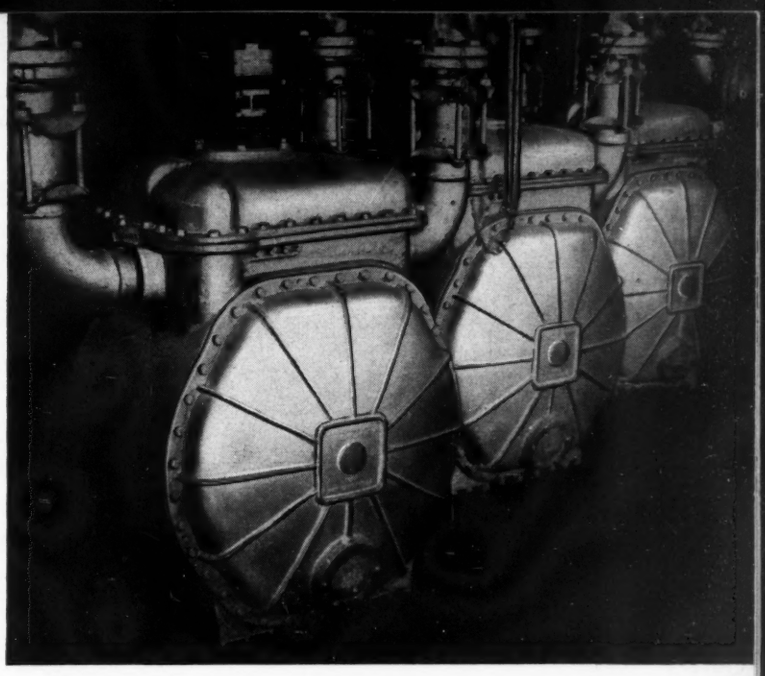
Membership: The Institute is supported by member companies which are divided into two groups—utilities, and appliance and equipment manufacturers.

At the present time the membership consists of 31 utilities and 18 appliance and equipment manufacturers. Membership is increasing daily and revised membership lists are sent to member companies from time to time.

Membership from gas companies is accepted on the basis of a 10-year underwriting and from appliance and equipment manufacturers on the same basis. Because of the difficulty of obtaining essential materials at this time, appliance and equipment manufacturers are given the right to cancel the agreement at the end of three years.

The organization plan of the Institute of Gas Technology is parallel to that of the Institute of Paper Chemistry at Appleton, Wis., which, during the 13 years of its existence, has developed into the paper industry's center for research and training, and has rendered an outstanding service. The Gas Institute is prepared to give this same invaluable service to the gas industry.

metering . .



Large volume measurement in a famous Southern hotel; three 500-B Ironcase meters with base pressure indexes.

●SPACE-SAVING equipment is welcomed by every engineer or superintendent who has tried to allot floor or ground space to large-capacity meters in a plant layout that refuses to stretch its dimensions.

Ironcase meter compactness therefore becomes prized as never before.

Note the blueprinted space requirements of these well-designed Low Pressure 500-B and 250-B meters...cut down to least possible dimensions without sacrifice of Metric Ironcase advantages.

FULL CAPACITY. Yet these meters attain full rated low-pressure capacity...4800 cubic feet per hour for the 500-B at ½" water differential, and 10,000 cubic feet at 2" differential; while the capacity ratings for the 250-B model are 3000 and 6000 cubic feet at the respective differentials.

RUSTPROOF . . . STURDY. Your Ironcase meter can be set safely against even a damp wall. The casting is one important feature which bears out the Ironcase reputation for sturdiness of construction throughout.

Ruggedness and insurance of accurate gas measurement are designed right into the Ironcase meter. Consider the advantages of these features . . . full bellows diaphragms . . . provision for correct lubrication of bearings . . . the one-piece body with table, partition, outlet channel and diaphragm channels all cast from a single mold. (The avoidance of vulnerable machined joints or gaskets between internal parts, makes internal leakage impossible.) Metric care in every phase of design and construction has raised the Ironcase meter to highest known industrial standards.

Your Ironcase catalog EG-40 covers in detail this timely subject of maintained meter accuracy and low operating cost per year.

1839

METRIC-AMERICAN

IRONCASE

Natural

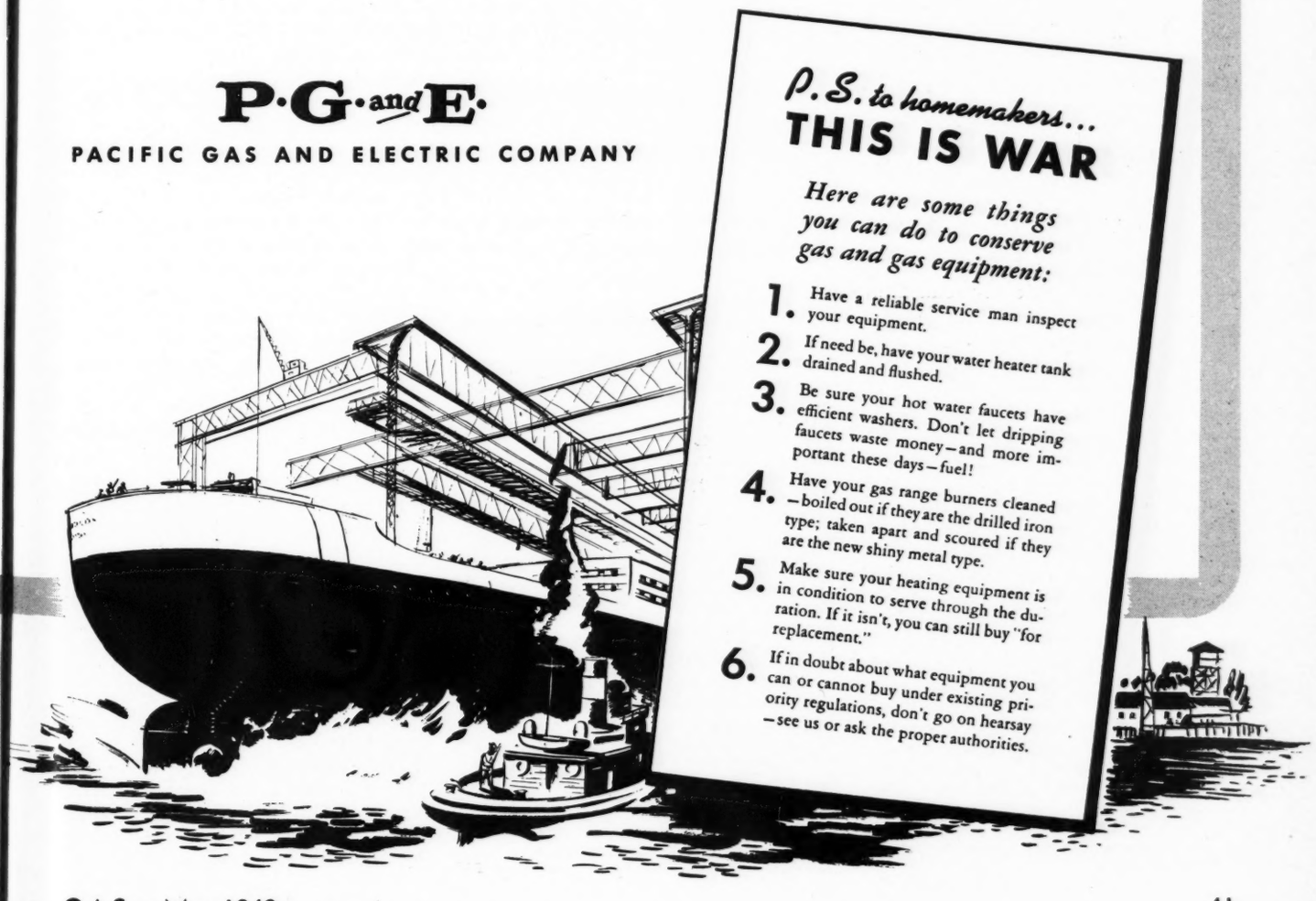
ASK ENGINEERS who are building America's fighting machine, Natural Gas is doing one whale of a job toward hastening the day of victory! ✩ At Sunnyvale, at the Alameda Naval Air Station, at the Benecia Arsenal and wherever there are shops for building or repairing military equipment, gas is proving so valuable in various precision heat treatments that ordnance experts say they couldn't get along without it. ✩ In the shipyards it is the same story on an even larger scale. Virtually all the yards are using Natural Gas for everything from little pipe-bending torches to huge plate and angle furnaces, core and mould drying ovens, and even, in some cases for large cutting operations. ✩ In addition to these strictly military chores, Natural Gas is also providing "just right" temperatures in tens of thousands of homes—not only permanent civilian homes but the temporary "homes" of selectees either in training or en route to the front. And "just right" temperatures mean comfort and health! ✩ The implication in all this should be obvious. Wartime uses for Natural Gas are *added* uses

Gas the fighting fuel!

and place a tremendous strain on available gas supplies. We must ask therefore that *everyone* conserve gas in *every way possible!* ✩ This is addressed to the trade (who are nearly all gas users), to our employees, and to the public in general. We want to be able to supply vital war industries and we are doing our utmost to be prepared, but in order to succeed, conservation must be a daily habit and duty with every one of us!

P·G·and E·

PACIFIC GAS AND ELECTRIC COMPANY


P. S. to homemakers...
THIS IS WAR
Here are some things you can do to conserve gas and gas equipment:
1. Have a reliable service man inspect your equipment.
2. If need be, have your water heater tank drained and flushed.
3. Be sure your hot water faucets have efficient washers. Don't let dripping faucets waste money—and more important these days—fuel!
4. Have your gas range burners cleaned—boiled out if they are the drilled iron type; taken apart and scoured if they are the new shiny metal type.
5. Make sure your heating equipment is in condition to serve through the duration. If it isn't, you can still buy "for replacement."
6. If in doubt about what equipment you can or cannot buy under existing priority regulations, don't go on hearsay—see us or ask the proper authorities.

Progress in Oil and Gas Conservation

By LESLIE MOSES

Attorney, Fohs Oil Company, Houston, Texas

THE petroleum industry had existed 20 years before the first regulatory statute was enacted in the United States. This statute was enacted in Pennsylvania, and provided for the protection of oil and gas formations against water intrusion. About 1886 the State of Indiana developed one of the greatest gas fields ever discovered and used every means possible to insure the longevity of the supply for domestic and commercial use.

The first real controversy between the policy of conservation and the policy of production arose out of the attempt of the State of Indiana to enforce this conservation statute. On one hand the proponents of conservation advanced the theory that the right to produce was subservient to the duty to the public not to waste natural resources. On the other hand the opponents of conservation insisted upon standing upon their legal rights to drill and produce oil and gas whensoever and howsoever they pleased. A statute prohibiting the use of flambeau lights in the burning of gas was held constitutional as a legitimate exercise of the police power of the state. The landmark case was *Ohio Oil Co. v. Indiana*, also involving the prevention of waste of gas.

In 1915 Oklahoma, having lost considerable oil through over-production, passed a far-reaching statute for the prevention of waste of oil. In 1919 the Texas Legislature formulated and passed an act for the prevention of waste of oil and gas and placed the enforcement of the act in the hands of the Railroad Commission. The Federal government, too, was looking into the question of undue waste and from 1917 on it published numerous tracts on the conservation of the reservoir energy of an oil pool in an effort to obtain the greatest possible recovery therefrom. In December, 1924, the Federal Oil Conservation Board was appointed by Calvin Coolidge, President of the United States, who made the following comments:

> "It is evident that the present method of capturing oil deposits is wasteful to an alarming degree and it becomes impossible to conserve oil in the ground under present leading practices if a neighboring owner or lessee wishes to gain possession of the deposits."

This reference was to the evils brought about by the application of the Rule of Capture and the Offset Drilling Rule, and the economic evils resulting therefrom in the competitive drilling then going on of the type found in the Cushing, Seminole and Oklahoma City fields in Oklahoma, the East Texas field, and the town lot area in the Los Angeles Basin, where each operator, regardless of the rights of his neighbors, sought to produce as much oil from his own property as he could.

Federal Assistance

Prior to the enactment of the NRA the four largest oil producing states had already put into force legislation for the conservation of the reservoir energy of its fields in order to obtain the largest possible ultimate recovery. Section 9 of the NRA indicated that the Federal Government would assist the states in their endeavor to conserve, and in the enforcement of their own statutes. That provision, however, was declared unconstitutional as an unlawful delegation of legislative power, but a petroleum code had already been adopted by the Act, conferring the administration upon the Secretary of the Interior. A pertinent provision was "(a) That any and all wells hereafter drilled shall be located in accordance with a plan of well location approved by the Administrator. . . . (b) That for the purpose of more properly conserving the natural resources of the pool, the production of oil and gas therefrom (1) shall at all times be without waste, as defined by the law aplicable; and (2) shall be limited so that gas will not be unduly wasted in or for the production of oil."

In 1929 a committee of nine of the American Bar Association was appointed to study the problems concerning the conservation of mineral resources. It recommended a compulsory state statute admirably suited to solve most of the problems incident to the conservation of reservoir energy for larger recovery. The greatest difficulty encountered in enforcing the various state laws was the fact that most of the crude oil produced moved in interstate commerce. However, the Connally "Hot Oil Act" was enacted in February, 1935, prohibiting the movement in interstate commerce of crude oil, or its products, where the same had been produced in violation of any state statute. Congress had also given its approval and consent to an interstate oil compact, entered into by a number of the important oil producing states.

Prior to 1924, when the Federal Oil Conservation Board was appointed, no serious effort had been made by the states to enact thorough and complete conservation statutes. The results of investigations made by the Bureau of Mines and the advancement of learning brought about by the establishment of schools of mines, geology and petroleum engineering in the various universities resulted in a system of public education that convinced even the most hard-headed oil operator that there were evils connected with the close spacing and competitive drilling methods that led to waste of reservoir energy and loss of recovery. The experience of operators in the Cushing, Seminole, Oklahoma City, East Texas and Los Angeles Basin fields was bearing fruit. Overproduction brought not only loss of reservoir energy and waste and smaller recovery, but also lower prices for crude. In 1931 the price of crude dropped to ten cents per barrel. Martial law was necessary to enforce the

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LESLIE MOSES

LESLIE MOSES received his Bachelor of Laws degree from Tulane University and was admitted to the bar of Louisiana in 1924, practicing law in New Orleans from 1924 to 1936. In 1936 he became counsel for Fohs Oil Co., Houston, Texas, which position he now holds. A member of the legal committee and the unitization committee of the Mid-Continent Oil and Gas Association, the wage-hour law committee of the Independent Petroleum Association of America, he is the author of various articles on oil and gas law in the Tulane Law Review, Texas Law Review, Mississippi Law Journal, and TAXES, The Tax Magazine. The article herewith presented consists of excerpts from a reprint from the Mississippi Law Journal, Vol. XIII, No. 3, March, 1941.—Editor.

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orders of the regulatory bodies of the states of Texas and Oklahoma. Out of these conditions, and others, came the modern era, characterized by the passage of well-considered, well-planned and comprehensive conservation laws.

The Modern Era

It is with respect to this later era, the modern era, that circumstances show how much force must necessarily be given to the proposition that a change in economic conditions in the business of producing oil necessitates a change in the type of police measure put into force. This new type of police measure must be capable of withstanding any and all attacks upon its constitutionality on the grounds that it violates the due process clause.

In Indiana the early conservation laws dealt with gas alone, and, in fact, most of the conservation statutes prior to 1927 referred to gas, and only gas, for two reasons. In the first place, gas was more volatile than oil; and, in the second place, the underground relationship between gas and oil was inadequately understood, if understood at all. In 1923 Arkansas applied the acreage factor to gas production. Under the terms of the act not only was the gas production limited to prevent waste, but ratable taking was also provided for.

In 1924 the Legislature of Louisiana made a somewhat different approach to the spacing problem in connection with its oil wells. Wells drilled on small tracts were penalized as to allowable production as against wells drilled on larger tracts. In 1929 Michigan enacted a gas well spacing act somewhat similar to the Arkansas statute referred to. In 1932 Mississippi passed an act placing a specific penalty on gas wells drilled on small tracts.

These statutes were predecessors to the general statutes against waste of every kind, either of oil or of gas. In almost every one of the major oil producing states, there have come into being statutes protecting the reservoir energy against depletion, waste and excessive use. In addition to such statutes almost every one of those states has attempted to control production, prevent waste, and restrain unnecessary drilling by the enactment and enforcement of well spacing legislation.

Well spacing has now become of great importance in controlling the efficiency of operations in a common pool or reservoir. It has been proven beyond doubt that close spacing is not necessary for the proper drainage of the reservoir. In fact, close spacing reduces the ultimate recovery from the reservoir, as it brings on a reduction in reservoir pressure due to the inefficient utilization of the reservoir energy.

All in all, these statutes have shown the concerted and unqualified effort on the part of the states to prevent waste, increase the life of the fields within their confines, and obtain the greatest possible ultimate recovery therefrom. In some states the desired results have been obtained with little or no litigation involving the enforcement of the statute, or questioning its constitutionality. In other states the fight has been bitter. The doctrine of correlative rights was recognized early in the struggle even in instances where there was no statutory provision for their enforcement.

In more recent years any number of cases have upheld the doctrine in supporting the constitutionality of conservation statutes, while the most recent trend seems to rely more and more upon the police power of the state, acting for the protection of the public interest and welfare, as the most sound and logical basis for upholding such statutes.

The Federal courts have advanced a theory that the states do not have the right to legislate for the protection of the correlative rights, apart from injury to public interest and welfare caused by waste. Their reasoning is that the doctrine as set forth in the *Ohio Oil* case has been used only as a part of the theory of the police power of a state acting in the public interest. In view of the more recent decision of *Erie Railroad Co. v. Tompkins* it is not known what the Federal courts would now hold.

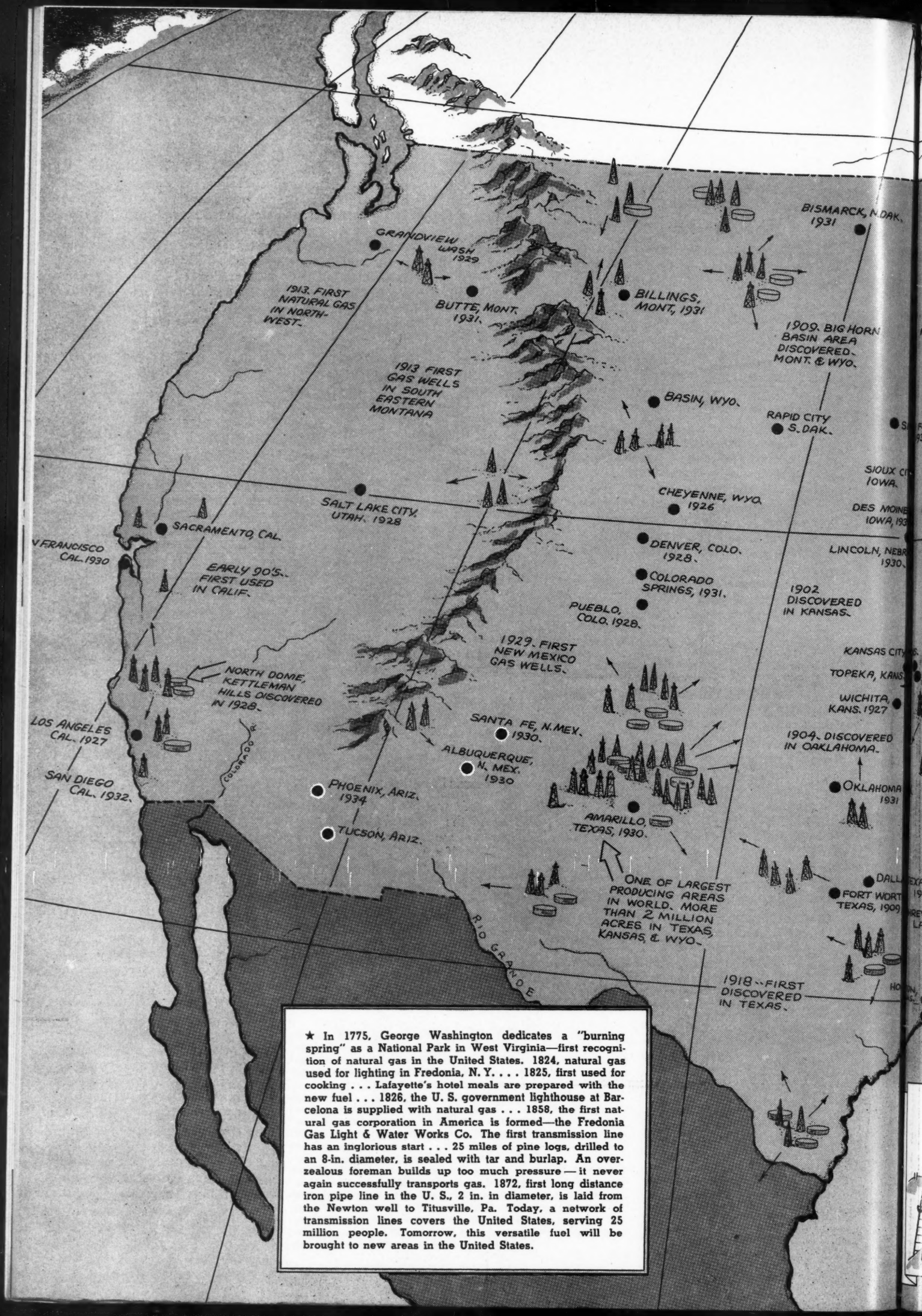
Arkansas Experience

The evils of over-production and waste prior to the enactment of comprehensive and modern conservation statutes are so self-evident and so well known that it is of little need to mention them. Experience in Arkansas offers the best example of what can happen when proper conservation statutes are not enacted. As early as 1888 there was gas discovered in Arkansas. After the turn of the twentieth century there were a number of gas fields in the western portion of the state. The operation of these fields was orderly, and what is astounding is the fact that there was no litigation relative to the waste of the gas. The fields were developed conservatively. In 1917 the first Gas Conservation Act was passed, due, not to the over-production and wanton waste, but primarily to inexperience on the part of the developers of the fields. After the passage of the act the inexperienced operator profited by the rules and regulations established. The right of the state to regulate the production of gas was never questioned. Oil was discovered in the state thereafter. The conservation statutes enacted prior to the finding of oil dealt with the production of gas only. There was no attempt to regulate the production of oil, as it was not contemplated at that time. Accordingly, the manner in which the fields were run, the method of production and operation, was a disgrace to the industry. El Dorado and Smachover ran wild. Oil flowed everywhere, polluting the streams, going to waste. The supply was tremendous, and method of disposal poor. Prices went down, the field reservoirs were dissipated. There was waste, above and below the ground. A conservation statute to protect the state and its resources was necessary and was enacted in 1923.

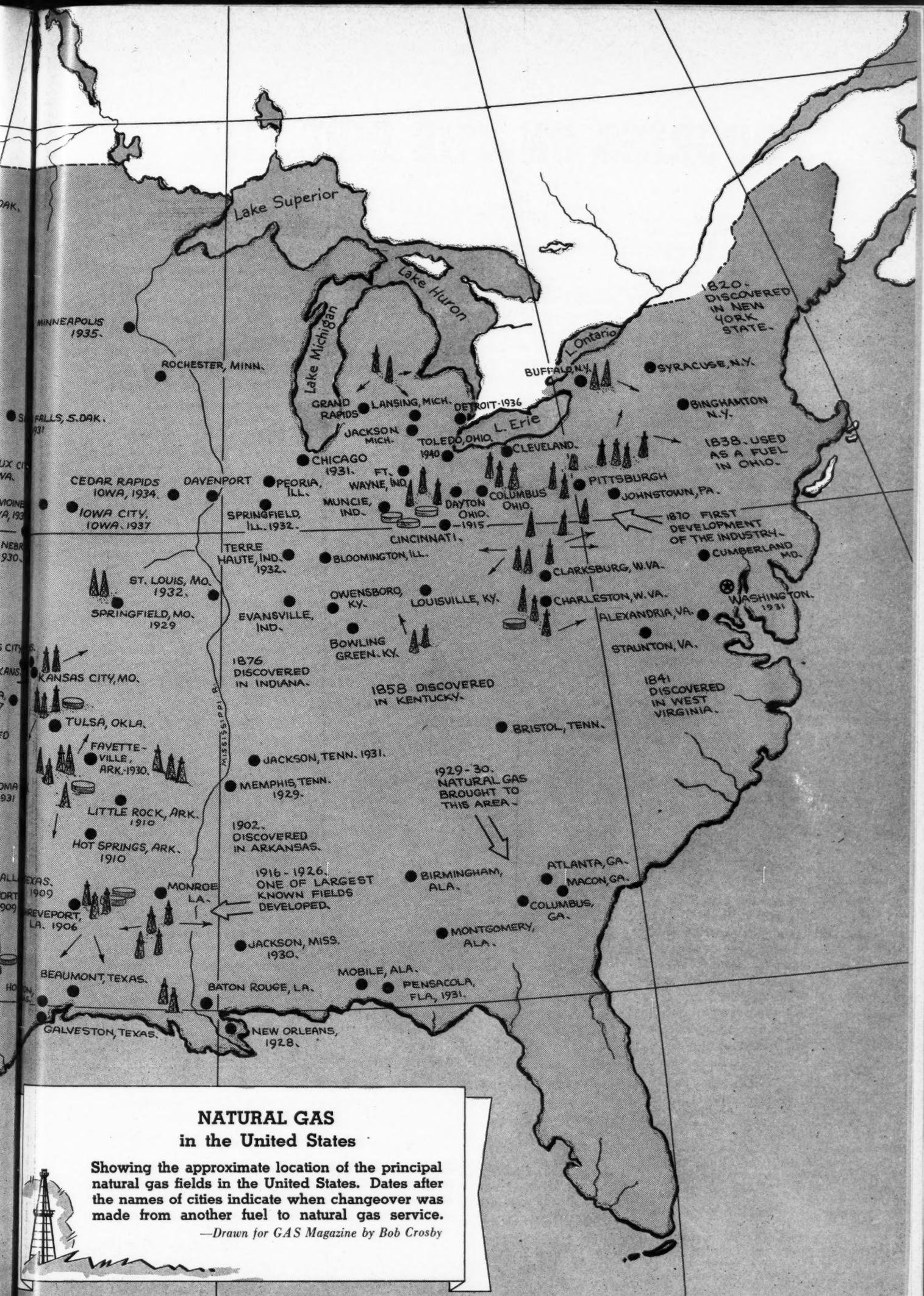
Compare, then, the evils attendant to the production of oil where there was no regulatory statute, and the reasonable, safe and sound practice *in the same state* growing out of the production of gas under a fair conservation statute. What better incentive to the enactment of such statutes is needed?

Conclusion

The modern theory of oil conservation, then, is a theory based upon the right of sharers of a common reservoir to take equitably therefrom in a way so as to prevent waste of reservoir energy, and to obtain the greatest ultimate recovery therefrom. This theory is based upon sound geological data, clear legal principles, wise economic policies and thorough business methods. If the courts should sanction what the legislatures have done towards carrying into execution this theory, the petroleum industry would enjoy a fair and reasonable degree of prosperity. Producers of crude oil are willing and, indeed, anxious to supply the market with its reasonable demand for petroleum. However, they clearly recognize the fact that the best storage space for excess crude is in the ground, where it is stored by nature. They do not want to engage in another struggle as a result of over-production. In the oil industry alone, where natural conditions are such as they are, one man, or a limited few, by excessive production under the Rule of Capture can force the entire industry into a similar state of over-production. The salvation of the industry lies in the willingness of each and every operator to permit each to enjoy that which belongs to him. This has not been accomplished without laws, and so the petroleum industry must submit to regulations. However, it is to the interest of the industry, the state, and the land-owners to secure such regulations as are fair and reasonable.


BISMARCK, N.DAK. 1931
GRANDVIEW WASH 1929
1913. FIRST NATURAL GAS IN NORTH-WEST.
BUTTE, MONT. 1931.
BILLINGS, MONT, 1931
1909. BIG HORN BASIN AREA DISCOVERED. MONT. & WYO.
1913 FIRST GAS WELLS IN SOUTH EASTERN MONTANA
BASIN, WYO.
RAPID CITY S. DAK.
SIOUX CITY IOWA.
CHEYENNE, WYO. 1926
SALT LAKE CITY, UTAH. 1928
SACRAMENTO, CAL.
DES MOINES IOWA, 193
LINCOLN, NEBR. 1930.
DENVER, COLO. 1928.
COLORADO SPRINGS, 1931.
PUEBLO, COLO. 1928.
1902 DISCOVERED IN KANSAS.
EARLY 90'S. FIRST USED IN CALIF.
1929. FIRST NEW MEXICO GAS WELLS.
KANSAS CITY
TOPEKA, KANS.
WICHITA, KANS. 1927
NORTH DOME, KETTLEMAN HILLS DISCOVERED IN 1928.
LOS ANGELES CAL. 1927
SANTA FE, N. MEX. 1930.
1904. DISCOVERED IN OKLAHOMA.
ALBUQUERQUE, N. MEX. 1930
COLORADO R.
SAN DIEGO CAL. 1932.
PHOENIX, ARIZ. 1934
OKLAHOMA 1931
AMARILLO, TEXAS, 1930.
TUCSON, ARIZ.
ONE OF LARGEST PRODUCING AREAS IN WORLD. MORE THAN 2 MILLION ACRES IN TEXAS, KANSAS & WYO.
DALLAS
FORT WORTH TEXAS, 1909
RIO GRANDE
1918 - FIRST DISCOVERED IN TEXAS.

★ In 1775, George Washington dedicates a "burning spring" as a National Park in West Virginia—first recognition of natural gas in the United States. 1824, natural gas used for lighting in Fredonia, N. Y. . . . 1825, first used for cooking . . . Lafayette's hotel meals are prepared with the new fuel . . . 1826, the U. S. government lighthouse at Barcelona is supplied with natural gas . . . 1858, the first natural gas corporation in America is formed—the Fredonia Gas Light & Water Works Co. The first transmission line has an inglorious start . . . 25 miles of pine logs, drilled to an 8-in. diameter, is sealed with tar and burlap. An overzealous foreman builds up too much pressure — it never again successfully transports gas. 1872, first long distance iron pipe line in the U. S., 2 in. in diameter, is laid from the Newton well to Titusville, Pa. Today, a network of transmission lines covers the United States, serving 25 million people. Tomorrow, this versatile fuel will be brought to new areas in the United States.



NATURAL GAS
in the United States

Showing the approximate location of the principal natural gas fields in the United States. Dates after the names of cities indicate when changeover was made from another fuel to natural gas service.

—Drawn for GAS Magazine by Bob Crosby

PROGRESS ON THE PIPE LINE

IN COOPERATION with the Office of Censorship, GAS has generalized the information presented in its annual survey of pipe line construction. This was done to avoid the possibility of aiding the enemy by supplying specific information on the routes and purposes of new lines. The publishers of GAS are grateful for the assistance given by the various natural gas transmission companies who supplied the basic data for this report.—Editor.

By J. BREWER AVERY
Research Editor, GAS

TO THE natural gas transmission companies, as to all other divisions of industrial America, the outbreak of War in the first week of December brought many new and perplexing problems. The obstacles of nature that barred easy progress along the routes from the sources of natural gas in the fields to the markets for natural gas in the populous areas of the country were familiar difficulties. To these was added the immediate necessity of meeting sharply increased demands from localities already served, and of expanding natural gas service to areas not yet reached, at a time when both manpower and materials were drastically curtailed.

Fortunately, these companies were already prepared to satisfy the primary natural gas requirements of a nation that was mobilizing for all-out production of war materials. Over a period of years natural gas transmission companies had built up a great system of more than 87,000 miles of transmission pipe lines that crisscrossed the country in the west, the south, the middlewest and the eastern middlewest.

In 1940 alone, more than 2700 miles of lines were laid to link the newer industrial sections of America with the tremendous underground reservoirs of natural gas in the south, the southwest and the west. To reach new territories and to care for the future growth of those markets already served more than 5600 miles were proposed.

Construction of these contemplated lines was hindered during the past year by two serious considerations. First, there was a scarcity of materials for the fabricating of pipe and pipe fittings, and second, there was the necessity of anticipating the changes in market areas resulting from the building of industrial plants in new locations with a consequent shift of population centers. Further, additional facilities were required to extend natural gas service to the military establishments and army camps that were springing up in many different parts of the country. By October, 1941, nineteen Army posts and four General Hospitals were using natural gas for cooking, water and space heating, or for cooking and water heating. (GAS, October, 1941, p. 36.)

Despite the difficulties of obtaining materials, the 1941 pace of pipe line expansion was maintained almost on a par with the record breaking year of 1940. Altogether, a total of 5679.5 miles of lines were either proposed, under construction or completed. Of this amount, 2246.4 were either under construction or completed, and 3433.1 miles were being considered. Table No. 1 presents a summary of the construction activity which the survey on the following pages gives in more detail. Table No. 2 summarizes the distribution mains now in operation.

Types Tabulated

The tabulations of pipe line construction cover two types of lines: new lines built to extend service to territories not previously served, or to bring additional supplies to areas currently served; and loop lines built to expand the capacities of lines already in operation. These two types are further classified as being proposed, under construction or completed. Some lines reported as under construction may have been completed by the time these figures are published.

In former years, this survey also revealed the origin, the terminus, the route, and the purpose of all lines reported. In the interests of National Security, however, this specific information was omitted and this year's review has been generalized.

Although the natural gas transmission companies have thus far been able to supply the major natural gas requirements of a country at war, the needs for additional quantities in the near future impose the necessity for the construction of new lines.

Currently three outstanding projects are either contemplated or under construction that will bring the benefits of natural gas to large sections of territory not now served. Undoubtedly, other extensions will be projected as the need for natural gas becomes acute in additional areas.

The first is a line to Wisconsin proposed by the Independent Natural Gas Co., a wholly owned subsidiary of the Phillips Petroleum Co. An application for a certificate of public convenience and necessity for the construction of this line has already been filed with the Federal Power Commission. According to the announced plans, an 877-mi. line of 22-in. diameter would be laid from the Panhandle field to Milwaukee, Wis.

Gas from this line would be delivered through branch and lateral lines to 10 public utility companies operating in southern and eastern Wisconsin for resale to the public in 75 communities in Wisconsin, including Milwaukee, Madison, Racine, Beloit, Green Bay, Middleton, Kenosha, Waukesha and Watertown.

Michigan Line

The second is a line to Michigan that is under construction by the Panhandle Eastern Pipe Line Co., Kansas City, Mo. After some difficulty in obtaining pipe and other required materials, deliveries of supplies began under priority ratings about the first of the year and work is progressing

TABLE NO. 1. SUMMARY OF DATA ON NATURAL GAS PIPE LINE CONSTRUCTION
Pipe Lines Completed, Building and Proposed, as Reported by 44 Companies
(April, 1941, to April, 1942)

Total miles reported on 98 lines	5679.5
Total miles completed and building	2246.4
Total miles proposed	3433.1
Reported costs of 1,835.8 miles	$38,134,947.
Estimated average cost per mile, based on reports of 1,835.8 miles	$20,800.
Estimated cost of total miles reported	$118,123,200

CONSTRUCTION OF NATURAL GAS PIPE LINES

April, 1941, to April, 1942†

Based on Data Supplied by 44 Gas Transmission and Distribution Companies

Company	Type	Status	Length (*Miles*)	Size (*Inches*)	Cost (*Estimated*)	Location
Arkansas-Louisiana Gas Co., Shreveport, La.	#New	Completed	8.0	16 & 10	$ 125,000	Arkansas
*Midwestern Engineering and Construction Co.	New*	Building	135.0	18 & 12	3,500,000	Arkansas
Birmingham Gas Co., Birmingham, Ala.	New	Completed	2.5	....	.....	Alabama
Border Pipe Line Co., Houston, Tex.	New	Proposed	40.0	5½	.....	Texas
Cities Service Gas Co., Bartlesville, Okla.	#New	Completed	55.0	16	750,000	Oklahoma
	New	Proposed	35.0	12	.....	Oklahoma
Cockburn Oil Corp., Houston, Tex.	New*	Completed	1.0	4½	.....	Texas
*C. W. Sternberg.						
El Paso Natural Gas Co., El Paso, Tex.	#Loop	Completed	7.0	6⅝	28,000	New Mexico
	#New	Completed	28.0	6⅝	135,000	Arizona
	#Loop	Completed	84.0	10¾	570,000	Arizona
	#Loop	Completed	68.0	16	680,000	New Mexico & Texas
	#Loop	Completed	51.0	12¾	408,000	Texas & Arizona
Gas Service Co., Kansas City, Mo.	#New	Completed	9.0	8	75,000	Missouri
Gas Transport, Inc.	New	Building	38.0	18 & 14	.....	West Virginia & Ohio
Guthrie Gas Utilities Co., Guthrie, Okla.	New	Completed	16.0	6	85,000	Oklahoma
Hoosier Gas Corp., Vincennes, Ind.	#New*	Completed	12.0	6 to 2	50,000	Indiana & Kentucky
*Line constructed and operated by Ray Phebus, Cenralia, Ill.						
Hope Natural Gas Co., Clarksburg, West Va.	#New	Completed	65.0	12¾	.....	West Virginia
*Ligin & Ligin.	New*	Completed	46.0	12	.....	West Virginia
*H. C. Price Co. (*Welding Only*)	#New	Proposed	826.0	22	25,000,000	Louisiana & West Va.
Houston Gulf Gas Co., Shreveport, La.	#New	Completed	5.7	6	.....	Texas
Houston Industrial Pipeline Co., Houston, Tex.	New*	Completed	3.0	6 to 3	.....	Texas
*C. W. Sternberg.						
Houston Natural Gas Co., Houston, Tex.	New*	Completed	4.0	8⅝	.....	Texas
*C. W. Sternberg.						
Houston Pipe Line Co., Houston, Tex.	New	Building	15.0	12	.....	Texas
Independent Natural Gas Co., Bartlesville, Okla.	New	Proposed	877.0	22	.....	Texas to Wisconsin
Kan.-Neb. Natural Gas Co., Inc., Phillipsburg, Kan.	#New	Completed	145.0	8⅝	750,000	Kansas & Nebraska
Kentucky Natural Gas Corp., Owensboro, Ky.	#Loop	Completed	3.8	8⅝	.....	Illinois
	New	Completed	2.7	6⅝	.....	Illinois
	#New	Completed	15.2	4½	.....	Indiana & Illinois
	#New	Completed	10.9	4½	.....	Indiana
Lone Star Gas Co., Dallas, Tex.	New	Completed	27.0	12	.....	Texas
	New	Proposed	15.0	6	.....	Texas
	New	Completed	1.0	10	.....	Texas
	New	Completed	2.0	3 & 2	.....	Texas
	New	Completed	3.0	12	.....	Texas
	New	Completed	9.0	12	.....	Texas
Louisville Gas & Electric Co., Louisville, Ky.	#Loop	Completed	4.0	6	21,500	Kentucky
Memphis Natural Gas Co., Memphis, Tenn.	#Loop	Completed	55.0	18	800,000	La., Miss. & Tenn.
	New	Proposed	62.0	18	1,200,000	Mississippi & Arkansas
Michigan Gas Transmission Corp., Detroit, Mich.	#Loop	Completed	9.0	6⅝	60,000	Indiana
Minneapolis Gas Light Co., Minneapolis, Minn.	#New	Completed	9.0	12¾	200,000	Minnesota
	#Loop	Completed	6.0	16	150,000	Minnesota & Illinois
Montana Dakota Utilities Co., Minneapolis, Minn.	New	Completed	13.0	....	.....	Montana
Mountain Fuel Supply Co., Salt Lake City, Utah	#New	Completed	18.0	8⅝	.....	Utah
	#Loop	Completed	32.0	18	750,000	Wyoming
Natural Gas Pipe Line Co. of America, Chicago, Ill.	#Loop	Completed	87.8	26	.....	Kansas
*This loop line completes looping program embracing 403 miles of 26-in. pipe. Contractors were W. A Bechtel and O. E. Dempsey.	#New & Loop	Completed	96.2	26	.....	Kansas
	#Loop*	Completed	83.7	26	.....	Iowa
	#Loop	Completed	99.1	26	.....	Nebraska & Iowa
	New	Proposed	10.0	8⅝	.....	Illinois
Ohio Fuel Gas Co., Columbus, Ohio	#New	Completed	12.0	12¾	.....	Ohio
	#New	Completed	16.5	12¾	.....	Ohio
Oklahoma Natural Gas Co., Tulsa, Okla.	New	Completed	10.0	5½	.....	Oklahoma
*E. M. Campbell & Co.	New*	Proposed	100.0	12	1,500,000	Oklahoma
	#New	Completed	5.0	5 & 6	16,000	Oklahoma
	#Renewal	Completed	7.0	16	100,216	Oklahoma
	#New	Completed	17.0	16	320,132	Oklahoma
	#New	Completed	3.0	4	16,400	Oklahoma
	#New	Completed	4.1	8⅝	32,200	Oklahoma
	#New	Completed	3.0	8	28,300	Oklahoma

†Figures on the construction in the first four months of 1941 were reported in GAS, May, 1941, p. 58 to 64.
#Report confirmed by company. Asterisks identify pipe line construction contractors.

Company	Type	Status	Length (*Miles*)	Size (*Inches*)	Cost (*Estimated*)	Location
Pacific Gas & Electric Co , San Francisco, Calif.....	#New	Completed	8.0	....	.....	California
	New	Proposed	51.0	12¾	761,800	California
Pan American Gas Co., Houston, Tex.....	New*	Building	25.0	8	250,000	Texas
*Williams Brothers Corp.						
Panhandle Eastern Pipe Line Co., Kansas City, Mo....	#New	Proposed	89.0	16 to 6	.....	Michigan
*I. C. Little.	#New*	Proposed	20.7	12	.....	Michigan
**Oil States Cons. Co.	#New*	Building	136.1	20 to 12¾	.....	Michigan
***C. S. Foreman Co.	#New**	Proposed	7.0	4	.....	Illinois
****J. C. Truman Const Co.	#New**	Building	41.0	8	.....	Illinois
	#Loop***	Completed	10.4	26	.....	Kansas
	#Loop***	Completed	10.2	26	.....	Missouri
	#Loop***	Completed	15.0	26	.....	Missouri
	#Loop***	Completed	16.4	24	.....	Missouri
	#Loop****	Building	24.8	24	.....	Illinois
	#Loop****	Building	36.0	24	.....	Illinois
	#Loop****	Building	2.6	24	.....	Illinois
	#Loop****	Building	20.2	20	.....	Illinois & Indiana
Peoples Natural Gas Co., Pittsburgh, Pa.....	New	Completed	28.0	6	.....	Pennsylvania
The Philadelphia Co., Pittsburgh, Pa.....	New	Proposed	190.0	....	.....	West Va. & Kentucky
Southern California Gas Co., Los Angeles, Calif.....	Loop*	Completed	16.0	18	75,000	California
*Macco-Robertson Co.	Loop*	Completed	4.0	16	26,000	California
Southern Natural Gas Co. of Birmingham, Birmingham, Ala.....	New	Building	135.0	14	.....	Louisiana
Southern Pipe Line Corp.....	New	Completed	19.0	10¾ & 8⅝	.....	Texas
Southwestern Light & Power Co., Tulsa, Okla.....	New	Completed	2.7	4	13,899	Oklahoma
Tennessee Gas and Transmission Co.,Chattanooga,Tenn.	New	Proposed	840.0	24 to 12¾	.....	Louisiana to Tennessee
Texas Pipe Line Co.....	New*	Proposed	72.0	6	.....	Texas & Illinois
*Williams Brothers Corp.						
Texoma Natural Gas Co., Chicago, Ill.....	#New & Loop	Completed	33.8	26	.....	Texas
United Gas Corp., Shreveport, La.....	New	Completed	50.0	....	.....	Louisiana
United Gas Pipe Line Co., Shreveport, La.....	#New	Completed	6.8	4	.....	Louisiana
*Latex Construction Co.	#New	Completed	43.0	10 & 8	.....	Louisiana
	#New	Proposed	198.4	16 to 12	.....	Louisiana, Ala. & Florida
	New*	Completed	21.0	8⅝	.....	Texas
	New*	Completed	10.5	4	.....	Texas
	New*	Completed	14.0	4½	.....	Louisiana
	#New*	Completed	18.0	18	.....	Texas
	#New	Completed	9.4	8⅝	.....	Louisiana
	#New	Completed	10.6	10¾	.....	Louisiana
	New	Completed	11.0	8⅝	.....	Mississippi
Universal Gas Co., Owensboro, Ky.....	#New	Completed	2.7	6⅝	.....	Indiana
Yankton South Dakota Gas Co., Yankton, S.D.....	#New	Completed	2.0	2	20,000	South Dakota

#Report confirmed by company. Asterisks identify pipe line construction contractors.

as fast as weather and the further delivery of materials will permit.

Approximately 250 miles of pipe will be laid in Michigan when the work is completed, with another estimated 150 miles of main line loops in Kansas, Missouri and Illinois. Additional compressor units have also been installed at three compressor stations along the present lines with another three units currently scheduled for early installation.

This line, when all sections are completed, will bring natural gas to about 66 cities and towns in Michigan and is expected to cost approximately $4,633,000. Among the many communities which are scheduled to receive natural gas from this development are Jackson, Marshal, Battle Creek, Kalamazoo and Flint.

The third is a line planned to expand natural gas service primarily in Tennessee. This has been proposed by the Tennessee Gas & Transmission Co., Chattanooga, Tenn., which has filed an application for a certificate of public convenience and necessity with the Federal Power Commission. The extension is expected to include an 840-mi. main line, supplemented by branch, lateral and gathering lines.

Doubly Important

This project is considered to be of double importance because it will not only serve natural gas to a new and important area, but also because it will carry gas to Muscle Shoals for burning in a steam standby electric generating plant and could, with the installation of compressor units, also supply additional gas to the companies serving the Appalachian region. Included in the cities to which natural gas would be served by this line are Nashville, Chattanooga and Knoxville.

The line is planned to start in the Jennings area of southern Louisiana where the company has arranged to purchase the major part of its gas. From there it will run northeast along the Louisiana gulf coast, across Mississippi, through the northwest corner of Alabama and thence into the southern central part of Tennessee.

The construction of lateral lines to reach aluminum and chemical plants in Tennessee, certain plants of the Tennessee Valley Authority in both Tennessee and Alabama is contemplated. Many branch and lateral lines in Tennessee and North Carolina which were originally planned have been abandoned for the duration of the present emergency, but it is likely that these lines will be constructed when conditions permit later.

One of the outstanding proposed lines of 1940 has not yet materialized. This is the 1500-mi. line the Reserve Gas Pipe Line Co. planned to build at a cost of $80,000,000 to bring gas from the Texas Panhandle to the greater New York area. Presumably, this project, which was intended to supply natural gas to the only great population center not now served either in whole or in part must await the return of peace before receiving further consideration.

TABLE NO. 2. MILES OF MAIN IN USE BY THE NATURAL GAS INDUSTRY IN THE UNITED STATES (1933-1940)

	1940	*1939*	*1938*	*1937*	*1936*	*1935*	*1934*	*1933*
Natural Gas Transmission..	87,900	85,200	83,400	82,000	80,900	80,100	79,300	78,700
Natural Gas Distribution...	107,200	106,200	104,100	102,300	99,100	95,900	94,700	93,300
Total Miles—Nat. Gas.....	195,100	191,400	187,500	184,300	180,000	176,000	174,000	172,000

Statistical Department, American Gas Association.

With the completion in late March of an 83.7-mi. section of looping line extending from Mahaska county to Muscatine county in Iowa, the Natural Gas Pipe Line Co. of America brought to a successful conclusion their looping program which embraced five projects totaling 403 mi. of 26-in. pipe. This series of loops add 50,000,000 cu. ft. daily to the line's present capacity.

For the first time in big line construction, fabricated pipe bends were successfully employed on this job. To install the factory bends, engineers tabulated each degree of bend, and the variation in depth of each bend, in advance of the ditch and pipe crews. Bends were then ordered on the basis of these compilations. This system also provides an accurate record of the location, depth, and degree of each bend.

Contractors handling the construction were O. E. Dempsey Construction Co., Tulsa, Okla., and the W. A. Bechtel Co. of San Francisco, Calif. Pipe and fabricated bends were supplied by A. O. Smith, compressors by Cooper-Bessemer, automatic valves and by-pass connections by Merco Nordstrom Valve Co., and bitumastic primer and enamel by Wailes Dove Hermiston Corp.

War industries in the Texas Cities district called for the laying of a new 25-mi. 8-in. line by the Pan American Gas Co., Houston, Texas, from the Chocolate Bayou field in Brazoria county to Texas City. Work on the line is expected to be completed within three months. Williams Brothers Corp. of Tulsa, Houston and Atlanta hold the general contract for construction with National Tube supplying the pipe. The cost of the line is estimated at $250,000.

California Gas Supplies Changed

A REVISION in gas rates to prevent increased costs to Pacific Gas and Electric Co. consumers in the Bay District and certain other Northern California areas, due to reduced heat content of the fuel, was proposed to the California Railroad Commission by its engineering staff at a hearing held in San Francisco on April 21.

Proposed schedules would mean a reduction of from 4% to 8%, or approximately $750,000 per year as computed on a cubic foot basis. Essentially the consumer will receive the same amount of heating units for the same cost as he has been paying in the past. It is expected that the new rates will be made effective on May 15.

Present rates are based on a heating value with a range of 1100 to 1200 B. t. u. per cu. ft. dry basis. In past years, and especially in 1941, there has been a gradual reduction in the heating value of the gas. Factors causing this are changes in the source of supply and the stripping of the higher heat constituents from casing head gas at the absorption plants before delivery to utilities.

P. G. and E.'s North Bay area, including Sacramento, Stockton, and Modesto, have already been cut over to a 1000 to 1100 B. t. u. gas coming from the Rio Vista field. Excerpts from a letter from Roy A. Wehe, gas and electric engineer with the Commission, explain the means proposed to adjust rates with gas B. t. u. content:

"In order to provide a means of gearing the heating value of the gas to that of the rates charged, the Commission's staff worked out and submitted a proposal, embodied in Special Condition (1) of the tariffs, submitted in Exhibit No. 11. These tariffs provide for the establishment of base rates predicated upon a heating value of 1100 B. t. u. The effective rates at any particular time are at such levels as may be determined by the heating value of the gas then served. The heating value clause provides for a maximum variation in the monthly average of the gas served of 35 B. t. u. above or below the 1100 B. t. u. standard. It further provides that when the actual variation exceeds 35 B. t. u. for two consecutive calendar months, the effective rates shall be changed by increasing or decreasing the rates to conform with the new average heating value. Adjustment, however, is not in 35 B. t. u. steps but in 50 B. t. u. steps.

For each 50 B. t. u. step, the change in the rate is 4%. In this respect it may be noted that the theoretical change predicated on the heating value is approximately 4½%. However, in order to compensate for the increased cost to the utility in the purchase of additional gas, because of the increased use by the consumer due to the reduction in each 50 B. t. u., the percentage for firm rates of the general service class is 4%, as stated. It is evident that the level of the percentage is a function of the relationship between the cost of gas and the selling price. For this reason, for those classes of service that have a lower selling rate, such as firm industrial, the percentage works out at 3% and if the same rule should be applied to surplus rates the percentage would be approximately 2%."

The relocation of pipe lines has made it necessary for the Pacific Gas and Electric Co. to take an increasingly larger supply of gas from Rio Vista, cutting out supplies from farther south.

In January, Pacific Gas and Electric Co. was granted permission by the Railroad Commission to cut over the Northern District of their San Joaquin Power Division to natural gas having an average heating value of from 1000 to 1100 B. t. u., in lieu of gas previously served with a heating value falling within the range of 1100 to 1200 B. t. u. Previously all the gas served in this area came from the Kettleman Hills field and/or the gas fields lying south of Kettleman Hills.

This order granted the company the authority to build pipe lines into the new Raisin City and Helm gas and oil fields which lie a relative short distance from Fresno. The full potential gas supply from these fields is not yet fully known, but undoubtedly requirements ranging up to as much as 15,000,000 cu. ft. per day can be taken, thus relieving the demand from Kettleman Hills on that gas, which then can either be sent south or north to the two large metropolitan markets.

In order that customers using the lower heating content gas shall have no increase in their billing because of the increased quantities of lower heating quality gas required to perform the same function, rates have been reduced in relation to the change in heating values of the gases served, or approximately 10%.

■ ■

More Gas Meters in Ft. Worth

Indications of growth and expansion in Ft. Worth, Texas, during 1941 were seen in the fact that on March 31, 1942 there were 2285 more gas meters in use than on March 31, 1941, despite a comparatively mild winter. This year's total was 42,702 as compared with 40,417 in 1941.

Status of Cathodic Protection in 1941

By KIRK H. LOGAN

Chief, Underground Corrosion Section, National Bureau of Standards, Washington, D. C.

THE protection of metal by the neutralization of the corroding current began in 1864, or earlier, if the use of zinc to prevent corrosion may be considered an example of cathodic protection. It is doubtful, however, if those who first used zinc for this purpose fully realized why the zinc protected the iron. Even now, many regard a layer of zinc applied to a pipe or sheet as a protective coating rather than a source of current. Another example of cathodic protection which antedates the methods now commonly used is the socalled pipe drainage system frequently employed in cities to prevent stray current electrolysis. Just when current from an external source was first superimposed on buried pipe to prevent soil corrosion is a controversial question, the answer to which depends somewhat on the interpretation of the objectives and methods of certain experimenters. The date, which was about 1910 or earlier, is of no great importance.

Within the last 10 years, cathodic protection has been widely used and the literature on the subject has become extensive. Much of the earlier literature deals with descriptions of installations of cathodic protection systems, their installation, and the amount of current employed. These papers were followed by others which set forth the principles governing cathodic protection with or without suggestions as to how the principles should be applied. At present, data on the effectiveness of cathodic protection are somewhat limited, largely because such data must be accumulated over a long period.

The primary purpose of this paper, which is based on a series of interviews with corrosion engineers, pipe line operators, and research chemists and physicists, is to present a picture of the present status of cathodic protection as an art, and to refer the reader to some of the more important literature on the subject. No attempt will be made to describe the application of cathodic protection to a pipe line because this depends on the nature and condition of the line. One who is considering his first application of cathodic protection will find it most economical in the long run to have the system designed by an engineer of wide experience in this line of work.

Theory of Cathodic Protection

The theory of cathodic protection is a corollary to the electrolytic theory of corrosion. The latter originally emphasized the idea that differences in conditions at the surface of a metal surrounded by an electrolyte resulted in differences of electrical potential. The transfer of ions from one area to another, which resulted from these potential differences, was accompaned by the removal of metal at the areas which discharged the positive ions, i.e., at the anodes. Early students of the electrolytic theory of corrosion were chiefly interested in the sources in the resistance of the electrolytic part of the electrical circuit.

Later, it was discovered that secondary phenomena, i.e., polarization brought about by changes in the electrolyte at the electrode surface and the accumulation of corrosion products, were of great importance, and these phenomena were used in attempting to explain why metals did not corrode more rapidly. It was found that as soon as current began to flow there were marked changes in the potential of the anode or the cathode, or both, with respect to a reference electrode in the electrolyte. Much of the fundamental work on corrosion and cathodic protection has centered around the changes in the potential of the anodes or cathodes.

If corrosion is caused or accompanied by a flow of current from the corroding metal, the obvious thing to do is to reduce this current to zero by changing the potential of the anode with respect to the adjacent electrolyte. This may be done by means of a sufficient superimposed current. This is the fundamental idea in cathodic protection. When a protective current is superimposed, the potential of the corroding areas, or anodes, does not change materially until a certain current density has been reached.[1] This critical current density is that required to prevent corrosion.

Explanations of what takes place at the electrodes have been presented by Mears and Brown[2] and by Hoar.[3] Scott[4,5] has published a series of rather highly technical articles dealing with the electrical conditions required for the protection of a pipe line. Rhodes[6] and Schneider[7] have discussed the theory of cathodic protection and have developed equations representing conditions necessary for electrical protection. Study of these papers will give those who are able to digest them a broad theoretical knowledge of cathodic protection. A very clear non-technical explanation of cathodic protection has been prepared by Smith[8] for the information of the pipe line foreman and others.

Criteria for Protection

With the work of previous investigators as a background, Ewing[9] attempted to determine the current density required to prevent corrosion in the

ACCORDING to a recent estimate, there are in operation at present 750 cathodic protection units protecting 3000 miles of pipe line. Because of the practical importance of cathodic protection in the pipeline industry it has been considered worth while to examine the present status of this means of combating corrosion. The results of this study, which is based on conferences held with pipe line engineers, indicate that the protection of transmission lines cathodically is both practical and economical, but that there are a number of problems to be solved before the full value of cathodic protection can be realized.

KIRK H. LOGAN

Mr. Logan has been connected with the Underground Corrosion Section of the National Bureau of Standards, U. S. Department of Commerce, for the past 30 years. The present work of this Section consists of three parts: (1) the determination of the resistance of metals and alloys to underground corrosion; (2) studies of coatings suitable for protecting pipes against soil corrosion; and (3) investigations related to cathodic protection. The latter activity is at present divided between a study of the effectiveness of zinc anodes as a means of protecting pipe under various soil conditions and an investigation of methods for determining when cathodic protection has been attained. A considerable part of the work of the section is related to defense work activities.

This study was presented at the Second Annual Water Conference of the Civil Section of the Engineers' Society of Western Pennsylvania, November 3, 1941.

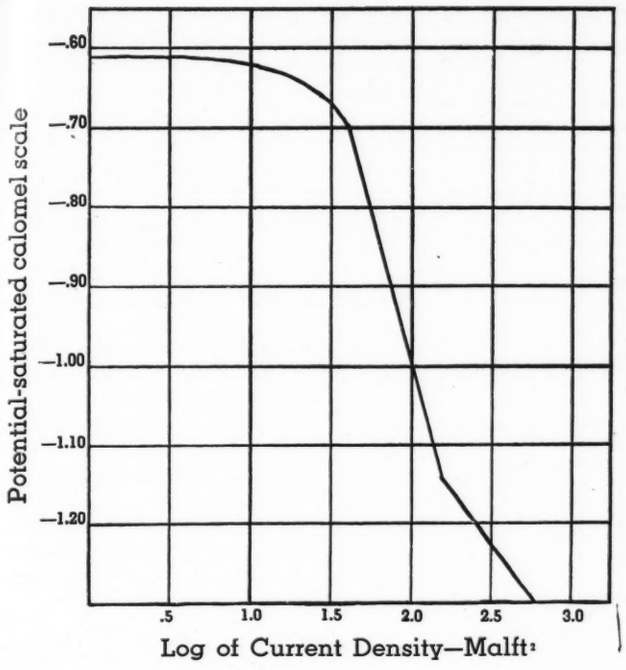


FIG. 1.
Log current density-potential curve.

laboratory and to apply his findings to field conditions. Ewing reached three conclusions of importance to users of cathodic protection: (1) The protective current always causes alkali to accumulate on the cathode surface. This is of interest to users of bituminous coatings since the accumulation of alkali beneath a coating tends to destroy the bond between the coating and the metal. The conclusion also has a bearing on anaerobic biological corrosion since sporovibrio desulfuricans thrives only under nearly neutral soil conditions. (2) The potential of the metal with respect to a reference electrode taken alone is no criterion of the rate at which metal is corroding. (3) When the current density exceeds the protective value the log current density-potential curve is a straight line with a negative slope. The beginning of this line is a criterion for determining when the protective current density has been reached. Fig. 1 shows a current density potential curve for an alkali soil. Field tests of Ewing's method applied to pipe lines indicated that under some conditions it was difficult to locate the critical point on the current density-potential curve. Moreover, Ewing's method for determining when a line was protected was somewhat difficult.

In the field tests referred to, the protective current densities ranged from 1.5 to 14 milliamperes per sq. ft. The potentials of the pipe when the protective current density was reached ranged from less than .5 volt to more than 1.2 volts negative with respect to a copper sulfate electrode. This tends to confirm one of Ewing's conclusions.

Rogers[10] found that in one soil a current density of 3.65 milliamperes per sq. ft. reduced the corrosion loss 98% of the original rate while in another soil a current density of 8.2 milliamperes per sq. ft. reduced the loss but 82%.

Hill[11] from laboratory experiments concluded that the potential of a pipe did not indicate the extent of its protection and found that the protective current density ranged between 1 and 10 milliamperes per sq. ft. In another paper[12] he concluded that in anodic areas where protection is not perfect the rate of penetration remains as high as without protection. He also found slight corrosion resulted from excessively high current densities.

Keeling[13] found that a current density of 15 milliamperes per sq. ft. was required to protect submarine lines.

From laboratory experiments Rhodes[14] concludes that the protective current density was 4 amperes per inch diameter per mile of pipe, which is equivalent to 2.8 milliamperes per sq. ft., a figure well within the range of protective current densities observed by Ewing in the field. Other writers[15] have accepted Rhodes value for the protective current density. Rhodes also concluded from laboratory experiments that after the pipe line reaches a steady state the potential of the line with respect to adjacent earth varies with the one-third power of the applied current. This relation has been used in estimating the current required to bring the line to a desired potential when some other current and potential have been observed.

The current densities so far discussed are the average current densities required for the protection of an uncoated line. If the line has been coated wth a dielectric material such as asphalt or coal tar, it will require protection only at the points where current can pass through the coating. The protective current density computed on the entire area of the pipe will, of course, be much less.

On the other hand, the use of a protective coating may introduce an unstable condition since many coatings change in resistivity with time.[17] The change may be the result of soil stress, the pressure of foreign objects or the growth of roots.

Data for a triple application of coal-tar enamel shielded by an asbestos-felt wrapper applied to about 2000 ft. of 8-in. steel pipe in 1937 are shown in Fig. 2. Great care was taken to secure as nearly a perfect coating as was possible. The data were supplied by Dr. J. M. Pearson of the Susquehanna Pipe Line Co., Allentown, Pa. The reduction in the nominal current density because of a coating will vary within wide limits, and no value for one line is directly applicable to another. One operator found that the current required to protect a coated line was about 4% of that required by an uncoated line.

Notwithstanding the findings of Ewing, Hill and Rogers most users of cathodic protection at the present time are determining whether their lines are protected by observing the potential of the pipe with respect to a copper sulfate electrode or a steel electrode, as recommended by Rhodes.[14] According to Rhodes, the potential of the pipe with respect to a steel electrode should be about .25 volt negative. One pipe line engineer in the central part of the country maintains his line .2 volt negative with respect to an iron electrode placed near the pipe, while a midwestern engineer believes different sections of his lines will have approximately the same rates of corrosion if no section is more than 80 millivolts positive to adjacent earth.

It is well to remember that the observed potential of the pipe, however measured, is the algebraic average of the individual potentials at different points on the surface of the pipe near the test location. It is different from the potential at the bottom of a pit and it may be different from the potential of another section of the pipe not far away. What the engineer desires is the condition of the pipe at the most anodic part, and this cannot be determined by any of the tests usually employed. Under the circumstances, attempts to attain accurately any definite potential or current density seem futile.

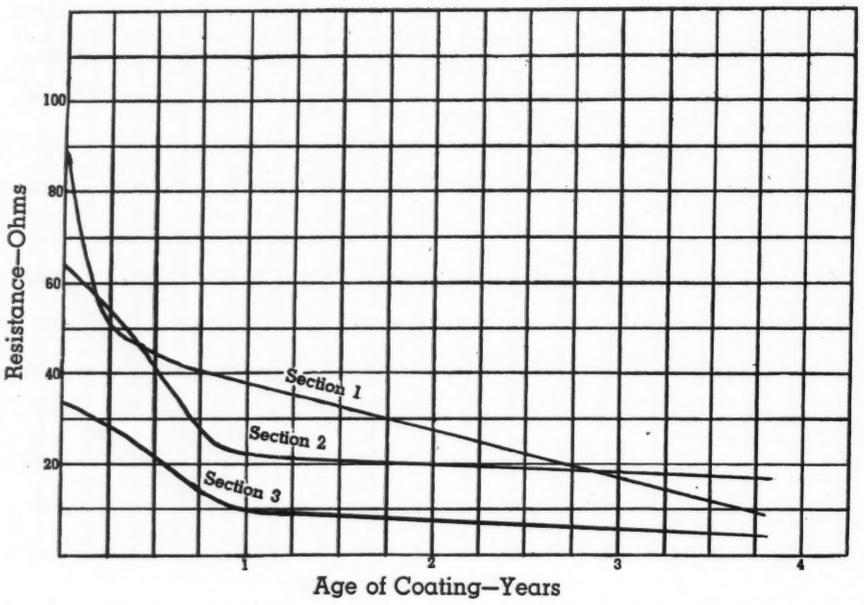


FIG. 2. Resistance of 4700 square feet of a modern reinforced coal-tar enamel coating.

Methods of Applying Cathodic Protection

How the protective current should be obtained and applied to the corroding pipe are matters that must be determined by studies of costs. It is in this connection that the consulting engineer justifies his employment by selecting the most economical source of power and the most advantageous distribution of anodes.

Scherer[18] recently estimated that there are now 750 cathodic protection units protecting 3000 miles of pipe line. Approximately 45% of the total number of units use rectifiers, mostly of the copper-oxide type, attached to power lines. The rectifiers range in output from 50 watts at 6 volts to about a kilowatt at 20 volts. Where transmitted power is not available, wind-driven generators provide power for about 20% of the installations. Their popularity appears to be decreasing, largely because many have been installed where the wind is not sufficiently continuous to be a satisfactory source of power. To be satisfactory, the wind should not drop below 5 miles per hour for periods longer than a day and it should blow more than 75% of the time. Engine-driven generators are increasing in popularity, especially for gas pipe lines.

Another source of power, not extensively used, but which has received considerable attention recently, is the primary cell formed by connecting aluminum, magnesium or zinc anodes to the pipe at frequent intervals. Of the anodes mentioned, zinc has been installed most frequently. As the current supplied by a single zinc anode is only a fraction of an ampere, a large number of anodes are required for the protection of any considerable amount of line. The cost of power from zinc anodes is relatively high, but it is used much more efficiently than power from other sources. The cost may be justified for this reason if only short isolated sections of a line require protection. A number of installations of zinc anodes have been in operation for two to six years and have apparently been satisfactory. Instances of reversal of the direction of the current between zinc and iron have been published.[15,16] This reversal has been attributed to the formation of zinc carbonate around the anode and to impurities in the zinc. In a single case investigated by the writer a zinc rod coated with a heavy carbonate layer was still anodic to the pipe line by .4 volt after having been in the ground two years. This anode like most zinc anodes now used was of high purity zinc.

Types of Installations

1. *Localized anodes*—The most extensively used systems of cathodic protection employ anodes or groups of anodes separated from a few hundred feet to several miles, i.e., one anode group is made to protect as much of the line as possible, sometimes 10 miles or more. The anodes usually consist of junk pipe or rails buried vertically or horizontally in the ground. The amount of iron used depends on the resistivity of the soil and the amount of pipe to be protected. Several pieces of pipe well separated are more effective than the same amount of pipe in a single piece, but there is usually an economic limit beyond which additional anode area is not justified. Since the potential difference between the pipe and the anode ranges from 6 to 60 volts, and the desired potential of the pipe with respect to adjacent ground is not more than 0.3 volt, the inefficiency of the system is obvious.

If junk iron is not available, carbon or graphite rods surrounded by coke are generally used. It is claimed that the corrosion losses of such anodes are confined to the coke, which can be renewed at small cost. Carbon is cathodic to iron and its use as an anode requires some additional power to overcome the difference of potential between the two elements.

Several engineers are attempting to develop non-corrodible anodes, or chemical anodes which do not deteriorate. However, because of the patent situation little information regarding such anodes is available.

2. *Distributed anodes*—If several miles of pipe are protected by a single anode or group of anodes, the potential of the pipe in the vicinity of the anode may be much lower than is necessary for the protection of the pipe, and there is a consequent waste of current. To reduce this waste of energy, Rhodes[21] uses a large number of anodes equally spaced and connected together in a line parallel to and not far from the pipe. This system reduces the voltage between anode and cathode required for protection and it is almost necessary if zinc anodes are used as a source of current. As the distributed anode system requires distributed power, the saving in power may or may not be balanced by the cost of the additional equipment required.

Costs of Cathodic Protection

The costs of cathodic protection differ greatly and depend on the type of installation and local conditions. The initial cost of anodes, power sources, and transmission lines usually is between $500 and $2000 per mile of line. Theoretically, the minimum current required to protect a pipe line is of the order of magnitude of the corroding current; practically, much more current is required. As has been stated, 4 amperes per inch in diameter per mile of bare pipe has been taken as the average current required. A number of companies have reported their power consumption and pipe mileage, but whether their lines are over or under protected can not be determined. In regulating the applied current, most companies are guided by the potentials of their pipe with respect to earth, as has been stated, but some are using the condition of cou-

pons attached to their lines as a guide. Installation and operating costs of cathodic protection systems have been reported in some detail by Rhodes[6,21] and by Davis[15].

If the line is covered with a bituminous coating, a large percentage of the surface may be insulated from the soil and much less current per inch of pipe will be required, at least during the first few years.

There is a difference of opinion whether a new line that is to receive cathodic protection should be coated when it is laid. The conclusion which an engineer will reach in answer to this question will depend largely on his assumptions as to the cost and permanence of the coating and the cost of current. Unfortunately, there are very few data on the permanence and usefulness of modern pipe coatings and and the records of most of the older coatings are not encouraging. If a line is already in the ground, cathodic protection is often more economical than reconditioning the line.

Cathodic Protection in Cities

Cathodic protection has been applied mostly to cross-country pipe lines. Application to pipe networks, especially if they are interlaced by other networks, is much more difficult. Cathodic protection is being tried[22] in a few cities and probably will prove satisfactory if the networks can be interconnected and treated as a single system. Not many reports on cathodic protection of city networks have been published. There is considerable uneasiness on the part of some users of cathodic protection as to their responsibility for the effect of their current on lines which cross or parallel the protected line. Cooperation of all pipeline owners in the same field seems very desirable.

Conclusions

Sufficient experience has been accumulated to show that cathodic protection of transmission lines is practical and economical. The failures which have occurred appear to be attributable to poor design or poor maintenance of the systems. Windmills were installed in places where they could not supply power over sufficient periods, and some of the engines used to generate power could not carry their loads continuously. Such failures are to be expected in any pioneering undertaking and are not to be taken too seriously. Generating difficulties have been overcome to a large extent. There is, however, great need for data on the current densities and their effectiveness in order that greater economies may be effected.

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Six Requirements Standards Adopted

THE American Gas Association Approval Requirements Committee, at its 49th meeting, held in March at the Testing Laboratories, reviewed and approved six sets of standards. These include new approval requirements for gas-fired duct furnaces as well as standards for installation of gas equipment in power boilers. New editions of those for domestic gas ranges, space heaters, central heating equipment and gas valves were also adopted. All are being submitted to the American Standards Association for acceptance.

New standards covering gas-fired duct furnaces were formulated as a result of extensive development of this type of furnace designed for installation in distribution ducts of air conditioning system to supply warm air for heating. As contrasted to forced-air central heating furnaces, they cover units which depend for air circulation on a blower not furnished as part of the furnace.

As a result of the increasing use of gas-burning equipment in hot water and steam power boilers, installation requirements for national application were prepared. Covering conversion to gas of such boilers originally designed for other fuels, provisions are incorporated covering ventilation, accessibility for cleaning and inspection, flues and flue connections, gas piping and meters. In addition, a number of inspection procedures and tests are included to assure satisfactory operating characteristics when a unit is placed in continuous service.

Among the major revisions to current American Standards, special mention may be made of the increased scope of those for gas valves. Formerly covering only gas burner valves they now include construction and performance tests for manual main gas-control valves and pilot valves, the title being modified accordingly.

In order to apprise interested manufacturers of the modifications which have been adopted, mimeographed copies of these standards were distributed during March. Following approval by the American Standards Association, they will be printed in final form and distributed.

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National Bureau of Standards Plans Corrosion Conference

The Underground Corrosion Section of the National Bureau of Standards is contemplating a Fifth Underground Corrosion Conference, which will last three days and be held late this year or early in 1943, if conditions permit. A convenient city, possibly Washington, D. C., will be selected if accommodations can be secured.

Attendance will be limited to authors of papers and members of their companies. Anyone may attend who presents a paper containing unpublished data related to underground corrosion or its prevention. Sales promotion papers are not desired.

Each author is to furnish the Bureau of Standards a number of papers sufficient to supply each author a copy. These papers to be sent six weeks prior to the conference. Each author receives a copy of each paper three weeks prior to the conference but not until he has furnished copies of his paper.

Information concerning suggested topics for the conference papers, etc., may be secured from K. H. Logan, Chief, Underground Corrosion Section, National Bureau of Standards, Washington, D. C.

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Pittsburgh Equitable Expands

Pittsburgh Equitable Meter Co. is now building a $250,000 two-story reinforced concrete addition to its Lexington avenue plant in Pittsburgh, Pa. The extension is scheduled for completion in June.

NU-WAYS

Cut-off Switch for Gas Compressors

THE flickering gas pressure of 0.1 or 0.2 in. which follows the striking of a gas main by a bomb is now familiar to a number of our readers. Many too will have visualized the possibilities when a main which has met such a fate happens to supply industrial premises which draw gas from the main by motor-driven boosters.

It is evident that in these special circumstances there is a possibility, the danger of which needs no emphasizing, of air being drawn into the main to form an explosive mixture. What may be not so well known, however, is that a safeguard against this possibility may be permanently obtained by installing at such premises a cut-off switch. (See diagram below.)

This switch, built by the Parkinson Stove Co., Ltd., Stechford, England, as can be seen from the diagram, consists of a diaphragm D, the underside of which is connected to the gas main by means of the connection C, while the upper surface is in communication with the outer atmosphere.

The diaphragm is linked to a rocking arm A pivoted at P, which carries a mercury switch S, connected to terminals T on the insulating block B, These terminals are connected to the "no-volt" terminals of the starter operating the gas booster installation.

So long as the diaphragm is supported by gas pressure the switch contacts are joined and the starter may thus be operated in the normal way.

If, however, due to main fracture or any other cause, the gas pressure falls below 0.2 in w.g., the diaphragm can no longer support the downward forces acting on it and will fall, breaking the electrical circuit and tripping the starter, thus stopping the motor.

Subsequent attempts to re-start the motor by means of the starter will have no effect until this circuit is again completed by the return of gas pressure, when the starter will again operate.

In the case of a small motor taking not more than 5 amps, it is possible to pass the motor circuit through the cut-off switch, but for all larger motors it is essential that a separate starter be used as described above.

Although the usual cut-off pressure is 0.2 in w.g. as given above, this may be increased by loading the diaphragm and a loose weight is shown dotted at W which can be employed to increase the operating pressure up to 0.5 in. water gauge.—*The Gas Times*, November 29, 1941.

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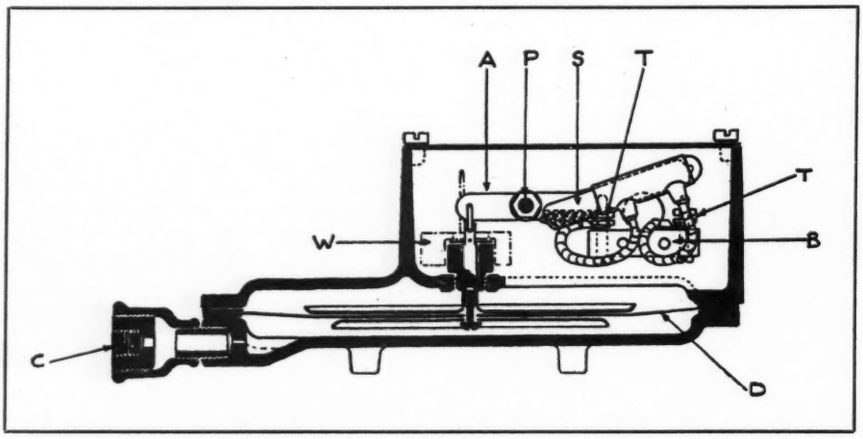


A cut-off switch of this type lessens the danger of air being drawn into the main to form an explosive mixture following the striking of a gas main by a bomb. The switch, manufactured by the Parkinson Stove Co., Ltd., Stechford, consists of a diaphragm D, the underside of which is connected to the gas main by means of the connection C, while the upper surface is in communication with the outer atmosphere.

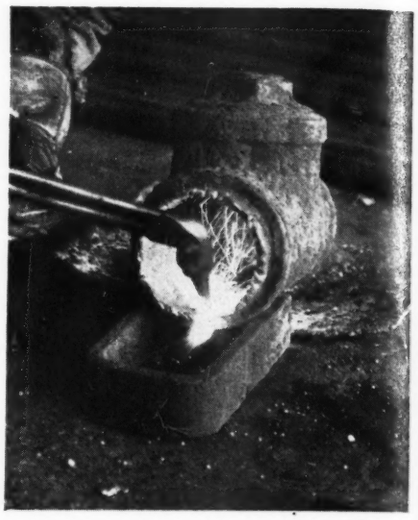


FIG. 1. Flame-gouging facilitates and speeds the removal of "dutchmen" from salvaged valves (shown), tees, and other fittings.

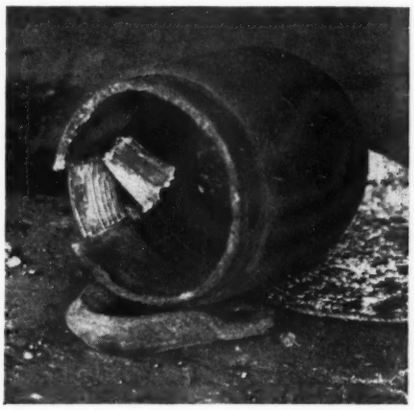


FIG. 2. Here the pipe wall is shown partially collapsed to indicate how the section is forced away from the fitting threads.

Flame Gouging

Flame-gouging — the oxy-acetylene process which provides a means for quickly and accurately removing a narrow strip of surface metal from steel plate, forgings, and castings—is daily becoming of increasing value in many phases of steel fabrication, repair, and maintenance. One recently developed application of unusual nature is the removal, by gouging, of pipe stubs or "dutchmen" from salvaged valves, collars, tees, and other fittings. Following the procedures outlined, operators of a large scrap yard have achieved a saving of 50% in operating time as compared with previous methods of doing the same work. In addition to facilitating and doubling production, the flame-gouging process permits such accurate control that threads on the valves and fittings are unmarred by removal of the "dutchmen."

In salvaging the 8-in. collar shown in Fig. 2, two parallel gouges were made across the inside of the pipe stub. The first was cut down to the threads. The second gouge was not cut quite as deep. The section of pipe wall between gouges was then collapsed by hammering inward. The "dutchman" was then easily removed.

ASSOCIATIONS

Ickes Headlines Natural Gas Meeting

HAROLD L. ICKES

HAROLD L. ICKES, Secretary of the Interior and Petroleum Coordinator, will be the principal speaker at the New Orleans Convention, May 4-7, which will bring together for the second time in joint meeting the American Gas Association's Natural Gas Convention and Distribution Conference. Mr. Ickes' address will be presented at a dinner to be held at the Hotel Roosevelt, New Orleans, Wednesday evening, May 6.

The 37th Annual Natural Gas Section Convention will be led by J. French Robinson, chairman, who is president of the East Ohio Gas Co., Cleveland. C. S. Goldsmith, distribution engineer of the Brooklyn Union Gas Co., is chairman of the Distribution Conference, which is meeting for the 19th consecutive year. The Spring Executive Conference, under the leadership of Chairman H. Carl Wolf, president of the Atlanta (Ga.) Gas Light Co., will be held in conjunction with the two meetings.

Principal speakers and their topics include: Edward L. Love, of New York, vice president of the Chase National Bank, "Natural Gas Financing Today for a Solvent Tomorrow"; H. V. Coes, of New York, vice president of Ford, Bacon & Davis, "Marketing Problems Under War Conditions"; Rex F. Harlow, associate professor of public relations at Leland Stanford University, "Public Relations, Yesterday, Today and Tomorrow," and George S. Hawley, of Bridgeport, Conn., president of the American Gas Association, "The Gas Industry's All-Out War Effort."

NEW ORLEANS

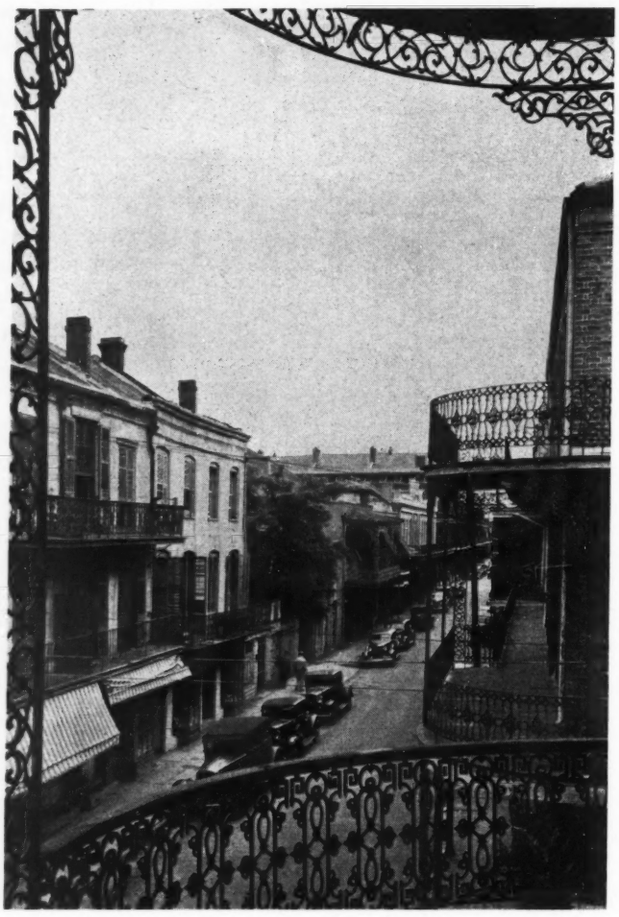
Those who go to New Orleans for the first time to attend the Natural Gas Convention and Distribution Conference will no doubt be impressed.

New Orleans has been an American city for 140 years, but it was a Latin city for nearly a hundred years before that and it is still one in a large measure in architecture, in government, in people and in spirit.

The Latin influence, of course, is most evident in the Vieux Carre, or as it is popularly known, the French Quarter. Most interesting part of the French Quarter is in the vicinity of Jackson Square, the old Place d'Armes, the name of which was changed in 1849 because an influential old lady, the Baroness Pontalba, included General Jackson among her heroes. The Square was at one time the heart of the old city and around it were grouped, in accordance with the plans of Adrian de Pauger in 1728, several of the most important buildings of the original city. In or near this square took place most of the city's important historical events, notably the consummation in 1803 of the Louisiana Purchase that was the turning point not only in the history of New Orleans but of the United States.

On either side of the Square are the famous Pontalba buildings, presumably the first apartment houses in America, built by the Baroness Pontalba in 1850. The apartments were considered wonderful structures in their day and if some of their freshness has gone with the passage of time, they have secured a charming, faded picturesqueness in their old age. Constructed of red brick, the two buildings are each a block in length and two stories in height and their long galleries are adorned with some of the finest cast-iron work in the city. In

Canal Street in New Orleans is America's widest business thoroughfare and is the dividing line between the old city and the new. It is 171 feet wide. The neutral ground and sidewalks are paved with marble. Canal Street, named from the waterway, was intended to connect the Mississippi River with Lake Pontchartrain.



ROYAL STREET, NEW ORLEANS, LA.

One of the main streets in the Vieux Carre (French Quarter) of New Orleans. It was originally named Rue Royalle - Bourbon, but Bienville, who founded the city in 1718 had its name changed to Rue Royale.

Like all other streets in the Vieux Carre, except one, Royal Street is 38 feet wide. On each side of it are buildings of Spanish and French architecture. Balconies are trimmed with laceworks of iron. This section of New Orleans is noted for its distinct Latin atmosphere. It was built by Creole aristocracy and that influence is still felt in the appearance of the old buildings and mansions.

Royal Street is now the center of the famous antique shops of New Orleans.

their high-ceilinged rooms lived for a time such notables as Jenny Lind and W. M. Thackeray.

Jackson Square is by no means the only point of interest in the French Quarter, although it is the focal one. Strolling along one of its narrow streets one comes across an odd, plantation type home known as Madame John's Legacy, famous for being the oldest residence in the Mississippi Valley. Vieing with it in age is the Ursuline Convent, begun prior to 1727 but not believed to have been completed until 1734.

When the Americans came in 1803, New Orleans was then an established cosmopolitan city with a fairly advanced civilization, in tone a miniature Paris. Simultaneously with the beginning of the American domination and the opening of the Mississippi Valley, New Orleans experienced an abrupt change—in commerce, government, population and mode of living. Since that time the city has expanded considerably in all directions, in fact to such an extent that it is in area the fourth largest city in the country.

The Garden District, considered by many equal to the French Quarter in charm, dates from 1816, when the plantation of Francois Livaudais was inundated by the floodwaters pouring in from one of the last crevasses in a New Orleans levee with the result that his land was covered with a fine river sand to a depth in some places of three feet. The added elevation and the porousness of the sand made the site for the Garden District.

New Orleans is extremely fortunate that it has both the old and the new, giving it an individuality all its own.

New Orleans has experienced a great building activity during the past few years. New Orleans Airport, considered one of the finest in the world, is built on land pumped up from the lake bottom and juts into the blue waters of Lake Pontchartrain like a giant arrowhead. The Mississippi River bridge, a 13,500,000 toll-free outlet to the west, was built where it was for long considered impossible for a bridge to stand. Although the turbulent river has not run over the levees at New Orleans for well over a hundred years, an entirely new method of flood control was tested there in February, 1937, when the Bonnet Carre Spillway was thrown open and proved its efficiency by lowering the water level at New Orleans several feet. And along the lakefront a great land development has been going on for several years that is transforming a former marsh into one of the country's

Leaders at the New Orleans Convention

A. B. PATERSON
Pres., New Orleans Public Service Co.

C. S. GOLDSMITH
Distribution Conference

H. V. COES
Speaker

E. L. LOVE
Speaker

B. R. BAY
General Program

H. CARL WOLF
Executive Conference

D. W. REEVES
Industrial Sales

B. M. LAULHERE
Gas Transmission

finest lakeshore park and residential districts. Many large units of the Army and Navy are located along the shores of the lake.

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Missouri Association Elects Officers at April Meeting

D. W. Snyder, Jr., president, Missouri Power & Light Co., Jefferson City, Mo., was elected president of the Missouri Association of Public Utilities at the annual business meeting of that association in St. Louis, April 14-15. Mr. Snyder succeeds Ben C. Adams of Kansas City, Mo.

Other officers elected at the meeting were: C. A. Semrad, first vice president; J. F. Porter, Jr., second vice president; and J. W. McAfee, third vice president. New members of the executive committee are: B. C. Adams, Alfred Hirsh, L. W. Helmreich and L. W. Laughlin.

Col. H. S. Bennion read an address by C. W. Kellogg, president of the Edison Electric Institute, New York, N. Y., on "Facing Our Problems," Mr. Kellogg being unable to attend. Hugh H. Clegg, assistant director, Federal Bureau of Investigation, Washington, D. C., spoke on "Utilities and Winning the War."

Hugh Stephens, vice chairman of the Missouri State Defense Council, delivered an address on "Utilities and National Defense," and Oliver T. Remmers, attorney, and past president of the St. Louis Safety Council, spoke on "A Quarter Century of Safety" at the Defense and Safety Meeting.

Frank M. Roessing, director of public works, Pittsburgh, Pa., spoke on "Utility Conditions in England as Viewed by an Official Observer," and Thomas N. Dysart, president, St. Louis Chamber of Commerce, spoke on "The Home Front" at the Wednesday luncheon which closed the convention.

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Maryland Utilities Holds Convention in Baltimore

The Maryland Utilities Association held its annual meeting at the Lord Baltimore Hotel, Baltimore, Md., April 24. The program was as follows:

"America's Battle For Rubber"—W. G. Kearney, manager, Mileage Contracts Sub-Division, Truck and Bus Tire Dept., The B. F. Goodrich Co., Akron, Ohio.

"Personnel Problems of Today"—James D. Dingwell, Jr., assistant vice president in charge of personnel relations, Washington (D. C.) Gas Light Co.

"Priorities"—Walker L. Cisler—consultant, Power Branch, War Production Board, Washington, D. C.

General Session speaker was De Loss Walker, former associate editor, *Liberty* Magazine, world traveler and lecturer, of Chicago, Ill., who spoke on "Offense Against All Enemies."

Lewis Payne, Eastern Shore Public Service Co., Salisbury, Md., was general chairman at the convention, and J. H. Purdy, Consolidated Gas Electric Light and Power Co. of Baltimore (Md.) was assistant chairman.

I. L. Stine, treasurer, Hagerstown (Md.) Gas Co., was chairman of the Gas section; A. L. Penniman, Jr., general superintendent of electric operations, Consolidated Gas Electric Light and Power Co. of Baltimore (Md.) was chairman of the Electric section; and F. D. Spofford, assistant to president, The Blue Ridge Transportation Co., Hagerstown, Md., was chairman of the Transportation section.

P.C.G.A. Technical Section Program Set

THE Pacific Coast Gas Association will hold its Spring Technical Conference at the Ambassador Hotel, Los Angeles, Calif., May 21-22. The tentative program as announced by H. P. George, general superintendent, natural gas production and transmission, Southern California Gas Co., and chairman, Technical Section, P. C. G. A., is as follows:

THURSDAY, MAY 21
10:00 A.M.—GENERAL SESSION

Address of Chairman—H. P. George, Gen. Supt. Nat. Gas Prod. & Trans., Southern California Gas Co.

"Wartime Curtailment & Revision of Construction and Maintenance Procedure"—K. B. Anderson, Coast Counties Gas & Elec. Co.; R. D. Smith, Pacific Gas & Electric Co.; and C. P. De Jonge, San Diego Gas & Electric Co.

"Adjustment of Service to Wartime Conditions"—Don C. Ellswood, Southern Counties Gas Co.

Luncheon—Outside speaker to be announced.

2:00 P. M.—PARALLEL SESSIONS

Distribution Committee
R. L. Cook, Southern California Gas Co., chairman.

1. *Special Problems*—S. A. Bradfield, Southern California Gas Co., sponsor.
   (a) "Telemetering"—W. A. LaViolette, Pacific Gas and Electric Co.
   (b) "Streamlining Service Dispatching"—F. W. Winfield, Southern California Gas Co.
2. *Construction and Maintenance*—J. E. C. Currens, Pacific Gas and Electric Co., sponsor.
   (a) "A New Tool Catalog"—L. L. Biggs and J. R. Brick, Southern California Gas Co.
   (b) "Progress in Boring"—J. D. Staples, Southern California Gas Co.
3. *Meters and Regulators*—H. A. Faull, Southern Counties Gas Co., sponsor.
   (a) "Discussion of Problems Imposed by War on Supply of Equipment."
   (b) "Modern Proving Room Methods"—E. M. Cloran, Pittsburgh Equitable Meter Co.
   (c) "Proving Meters Under High Pressure"—Henry Harris, Southern California Gas Co.

Transmission Committee
F. F. Doyle, Pacific Gas and Electric Co., chairman.

1. *Pipe Lines*—F. E. Wilson, Pacific Gas and Electric Co., sponsor.
   (a) "A New Type Oil Separator"—J. E. Currens, Pacific Gas and Electric Co.
   (b) "Earth Slide Control"—Wm. Johnson, Pacific Gas and Electric Co.
2. *Pipe Protection*—Wm. R. Schneider, Pacific Gas & Electric Co., sponsor.
   (a) "Simplified Water Testing for Plant Operators"—D. R. Hiskey, Dearborn Chemical Co.
   (b) "The Cleaning of Pipe Corrosion Coupons"—A. C. Alter, Southern Calif. Gas Co.
   (c) "Cathodic Protection on Distribution Systems"—Ray M. Wainwright, Montana-Dakota Utilities Co.
   (d) "Corrosive Action of Calcium Chloride Brine on Gas Dehydrating Equipment"—N. K. Senatoroff, Southern Counties Gas Co.
   (e) "New Design of Evaporator for Calcium Chloride Brine Dehydration Plant"—B. M. Laulhere, So. California Gas Co.
   (f) "Experience With Drainage on Short Bare Sections of Pipe Line"—H. J. Keeling, Southern Counties Gas Co.
3. *Large Volume Measurement*—L. F. Reetz, Pacific Gas and Electric Co., sponsor.
   (a) Discussion of Wartime Problems.
4. *Compressor Plants*—R. E. Morter, Pacific Lighting Corp., sponsor.
   (a) Discussion of Wartime Problems.

Utilization Committee
H. W. Geyer, Southern Counties Gas Co., chairman.

1. *Appliance Installation*—C. A. Thorp, Southern California Gas Co., sponsor.
   (a) "Multiple Venting of Water Heaters."
   (b) "Testing Vent Cowls."
2. *House Heating Research*—Guy Corfield, Southern California Gas Co., sponsor.
   (a) "Warm Air Distribution in Residences"—W. V. Fitch, Utility Fan Co.
   (b) "Usable Heat"—Arthur Theobald, Payne Furnace & Supply Co.

FRIDAY, MAY 22
10:00 A.M.—GENERAL SESSION

"Safety Practices"—E. E. Ellis, Southern California Gas Co.

"Activities of Civil Defense Utility Committees"—A. B. Newby, Southern California Gas Co.

Luncheon—Outside speaker to be announced.

"Protective Measures for Transmission Facilities"—C. D. Merritt, Pacific Lighting Corp.

"Fighting Fires in Distribution Mains and Structures"—C. F. Briscoe, Southern Counties Gas Co., and W. M. Henderson, Southern California Gas Co.

Adjournment.

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Conservation Is Keynote of A. P. I. Meeting in Pittsburgh

The American Petroleum Institute's division of production meeting was held April 9-10 at Hotel William Penn in Pittsburgh, Pa. A government explanation of the M-68 regulations stressing conservation was a feature of the rst afternoon session.

Authorities speaking were Frank M. Brewster, director of natural gas for District 1 fom Office of Petroleum Co-ordinator, Washington, D. C.; and J. French Robinson, of East Ohio Gas Co., Cleveland, Ohio.

Chairmen elected included: M. G. Gulley, chairman for 1943, Gulf Oil Corp., Houston, Texas; and the following vice chairmen: K. B. Anderson, Columbian Carbon Co., Charleston, W. Va.; V. F. Bowyer, Peoples Natural Gas Co., Pittsburgh, Pa.; R. E. Damp, Carter Oil Co., Mattoon, Ill.; W. E. Ferguson, Ohio Fuel Co., Columbus, Ohio; C. B. Irby, Turner Petroleum Co., Mt. Pleasant, Mich.; J. V. Goodman, Equitable Gas Co., Pittsburgh, Pa.

War Is Topic of Midwest Meeting

THE paramount problem facing the gas industry today is that of contributing all it can to winning the war, said John W. West, Jr., at the 37th Annual Meeting of the Midwest Gas Association which was held in Sioux City, Iowa, April 13.

Mr. West, secretary of the Residential Section of the American Gas Association, spoke on "The War and the American Gas Association." He forecast a tremendous backlog of demands for durable goods after the war with a corresponding increase in competition.

He told the delegates that it would be necessary during the war to take the best of care of gas ranges, water heaters, and other equipment since prioritites make it impossible to replenish the present supplies.

W. E. Derwent of the Geo. D. Roper Corp., Rockford, Ill., and president, American Gas Appliance and Equipment Manufacturers, discussed the effects of the national emergency on the production of gas equipment.

Mr. Derwent stated that no additional supplies will be available for production of equipment when the present supplies have been exhausted. He visualized a great increase in business during the post-war period, however, and urged that efforts be concentrated on public relations work. Educational and advertising programs should be maintained during the war, he said.

Other speakers on the convention program, which was limited to one day because of the war, were C. A. Nash, sales promotion manager for the United Light and Power Co., Davenport, Iowa, who talked on various sales problems, created by the national emergency, and Harry K. Wrench, president and general manager, Minneapolis (Minn.) Gas Light Co., who discussed problems concerning general operations of gas utilities.

The Association's Annual Banquet was held in the evening, followed by an entertainment program. There were no addresses.

About 85 representatives attended the convention from Iowa, Nebraska, North and South Dakota, Colorado, Minnesota, Montana and Wyoming.

Selected for three-year terms on the executive council were B. R. Bay of Omaha; R. E. Crawford of St. Peter, Minn.; R. M. Heneman of Ottumwa, Iowa; and A. E. Higgins of Pittsburgh, Pa. It was voted to hold next year's convention in April at Omaha, Neb.

The meeting was called to order by H. E. Peckham, president of the Northern States Power Co., St. Paul, Minn., and retiring president of the Association. He asserted that it is necessary for members to understand that priority regulations are for the best interests of the nation and should be gracefully accepted. The trading among companies of manpower and equipment, he said, probably is one of the methods by which the association can materially aid the country's war effort.

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S. C. M. A. Monthly Meeting

The Southern California Meter Association held its monthly meeting April 16, 1942 at the Rio Hondo Country Club, on the outskirts of Los Angeles. Highlight of the program was a report by W. L. Cowan, chairman, S. C. M. A. Gas Measurement Committee, on the committee's progress in the development of Superexpansibility Factors for Gases above 500 lbs.

CALENDAR

May

American Gas Association Spring Executive Conference—New Orleans, La., May 4.

Annual American Gas Association Natural Gas Section Convention — Roosevelt Hotel, New Orleans, La., May 4-7.

American Gas Association Distribution Conference — New Orleans, La., May 5-7.

Indiana Gas Association Annual Meeting—Indianapolis, Ind., May 11-12.

Natural Gasoline Association of America—Mayo Hotel, Tulsa, Okla., May 13-15.

Pennsylvania Gas Association—Philadelphia, Pa., May 18.

National Defense Exposition (Industrial-Petroleum Engineering)—Houston, Texas, May 18-24.

Pacific Coast Gas Association Technical Section Meeting—Ambassador Hotel, Los Angeles, Calif., May 21-22.

American Gas Association Production and Chemical Conference — New York, N. Y., May 25-27.

June

Canadian Gas Association, 35th Annual Meeting—Windsor Hotel, Montreal, Canada, June 4-5.

Pacific Coast Gas Association Sales and Advertising Section Meeting—Ambassador Hotel, Los Angeles, Calif., June 4-5.

Pacific Coast Gas Association Accounting Section Meeting—Ambassador Hotel, Los Angeles, Calif., June 11-12.

American Society for Testing Materials — Chalfonte-Haddon Hall, Atlantic City, N. J., June 22-26.

September

Mid-West Gas Association Annual Gas School and Conference—Ames, Iowa,, September 8-10.

Pacific Coast Gas Association Annual Convention — San Francisco, Calif., September 28.

24th Annual Convention, American Gas Association — San Francisco, Calif., September 29-October 1.

November

Mid-Southwestern Gas Association Meeting—Dates not definite.

Canadian Gas Association to Meet June 4-5 in Montreal

THE 35th Annual Convention of the Canadian Gas Association will be held at the Windsor Hotel in Montreal, June 4-5, according to an announcement issued recently by George W. Allen, secretary-treasurer of the association.

The tentative program has been announced as follows:

"Market Survey"—H. P. Nagel, Dominion Natural Gas Co., Ltd., Brantford, Ont., Canada.

"The CP Program — Its Accomplishments and Future."

"Difficulties With Shifting Soil in Maintaining a Gas Distribution System"—Alan H. Harris, Jr., manager, gas utility, Winnipeg (Canada) Electric Co.

"Observations From Data Taken With a Flash-Back Instrument"—J. A. Morrison, supervisor of laboratory, distribution department, Consumers Gas Co. of Toronto, Canada.

"The Gas Meter"—J. D. Von Maur, engineer of distribution, Consumers Gas Co. of Toronto, Canada.

"The Gas Industry's Activities in War Time" — T. P. Pinckard, vice president and general manager, United Gas & Fuel Co. of Hamilton, Ltd., Hamilton, Ont., Canada.

In addition to the above, there will be the usual "Question Box Hour," when many questions will be introduced by members of the association for discussion. The annual dinner will also be held on an abbreviated war-time basis.

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A. G. A. Forms Sub-group to Handle Emergency Problems

The Approval Requirements Committee of the American Gas Association, headed by C. H. Waring, superintendent of the Kansas City (Mo.) Gas Co., has appointed a special subcommittee on Emergency Modification of Requirements. Need for the new committee became apparent when demands resulting from the war production program and ensuing difficulties in obtaining materials and supplies brought many requests for modifications or suspension of certain existing approval requirements.

Headed by Lyle C. Harvey, president of the Bryant Heater Co., Cleveland, Ohio, the committee consists of two manufacturers, two utility company representatives, and the secretary of the Approval Requirements Committee. In addition, the chairman of the Working Committee on Housing and Realty Projects of the American Gas Association is an ex-officio member.

Further information regarding this special subcommittee may be secured by addressing R. M. Conner, secretary, A.S.A. Sectional Committee, Project 221. A.G.A. Approval Requirements Committee, 1032 E. 62nd St., Cleveland, Ohio.

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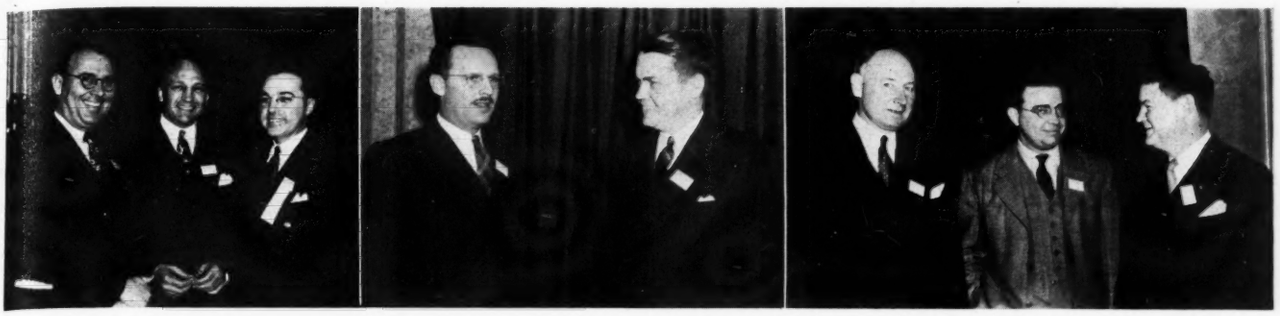
P.C.G.A. Meeting Is Sept. 28

The Annual Meeting of the Pacific Coast Gas Association will be confined to a business meeting on September 28, due to the Annual Meeting of the American Gas Association being scheduled for San Francisco September 29-30 and October 1. If conditions should require the cancellation of the AGA meeting some change may be made in these plans. The Accounting Section of PCGA will meet June 11-12 at the Ambassador Hotel, Los Angeles.



At the two-day sessions of the Southwestern Gas Measurement Course in Norman, Okla., April 21-23, public and industry leaders from all sections of the country were in attendance. Among those present were (left to right): Louis T. Krueger, Northern Utilities Co., Casper, Wyo.; H. B. Dismukes, United Gas Pipe Line Co., Bogalusa, La.; Haden Rawlinson, Dallas Gas Co., Dallas, Texas; Joseph A. Brandt, president of the University of Oklahoma, Norman, Okla.; Earl Kightlinger, Arkansas-Louisiana Gas Co., Shreveport, La.; Max K. Watson, Canadian River Gas Co., Amarillo, Texas.

Gas Measurement Course Studies War Problems

ALTHOUGH enrollment was reduced from 705 in 1941 to 565 this year, attributable to war conditions and tire shortages, the attendance upon classes in proportion to total enrollment at the Southwestern Gas Measurement Short Course for 1942, held in Norman, Okla., April 21-23, was larger than ever before.

Because of this increased interest and the growing importance of the natural gas and oil business to the successful prosecution of the war, the course will be held again next year.

The short course was sponsored, as in former years, by the College of Engineering, University of Oklahoma, assisted by the Corporation Commission of Oklahoma, The Corporation Commission of Kansas, the Railroad Commission of Texas, The Oklahoma Utilities Association, the Natural Gas Section of the American Gas Association and the Natural Gasoline Association of America.

Max K. Watson, assistant general superintendent, Canadian River Gas Co., Amarillo, Texas, was elected chairman of the general committee for the 1943 short course, to succeed G. W. McCullough, Phillips Petroleum Co., Bartlesville, Okla. Due to the enforced absence of Mr. McCullough because of important business, Mr. Watson, who was chairman of the program committee for this year, presided at all the general sessions. Earl Kightlinger, Arkansas - Louisiana Gas Co., Shreveport, La., was elected chairman of the program committee for the 1943 school.

Twenty-two states and the Republic of Mexico were represented at the short course, Miss Kate A. Niblack, chairman of the registration and publicity committee, revealed. W. H. Carson, dean of the college of engineering, University of Oklahoma, as for several years past, was in charge of local arrangements and the banquet and entertainment held Thursday evening, attended by 409 delegates. Dean Carson also opened the first general session.

In his "Address of Welcome," Joseph A. Brandt, president, University of Oklahoma, complimented the natural gas, gasoline and oil industries on the important parts they are playing in furnishing essential fuels, power and materials for winning the war.

Burt R. Bay, president, Northern Natural Gas Co., Omaha, Neb., reviewed the growth of the natural gas industry in Kansas, Oklahoma, Texas and Louisiana, and stated that this section is now supplying fuel needs as far west as Colorado and Arizona, north to Michigan and South Dakota and east to Georgia.

E. C. McAninch, Tulsa, Okla., chairman of the committee for the study of practical methods, presented a report on "Odorizers and Their Operation," listing six principal types.

Other speakers at general sessions included: L. K. Spink, The Foxboro Co., Foxboro, Mass., on "Fundamental Principles of Orifice Meters"; A. D. McLean, Pittsburgh Equitable Meter Co., Pittsburgh, Pa., on "Fundamental Principles of Displacement Meters"; G. M. Kintz, supervising engineer, U. S. Bureau of Mines, Dallas, Texas, on "Safe Handling of Petroleum Gases," accompanied by practical demonstrations with equipment; J. J. Delaney, Reliance Regulator Corp., Alhambra, Calif., on "Fundamental Principles of Regulators"; and Reford Bond, chairman, Oklahoma Corporation Commission, who reviewed some of the work of the commission relating to the oil and gas industries.

Classes and demonstrations relating to measurement and regulation of natural gas and handling and repair of equipment took place every afternoon.

Winners of cash prizes for best papers on "What I Learned at the Gas Measurement Short Course," were: first prize, $15—Walter E. Tucker, Continental Oil Co., Electra, Texas; second prize, $10—R. M. Van Horn, Lone Star Gas Co., Dallas, Texas; five third prizes, $5 each—W. L. Lindsley, Kansas Power and Light Co., Manhattan, Kansas; R. L. Ledbetter, Continental Oil Co., Basila, La.; B. H. Fowler, Phillips Petroleum Co., Bartlesville, Okla.; L. T. Krueger, Northern Utilities Co., Casper Wyo.; and Charles C. Hurst, Arkansas-Louisiana Gas Co., Shreveport, La.

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Petroleum Electrical Assoc. Holds Corrosion Conference

A special Corrosion Conference was held by the Cathodic Section during the Annual Convention of the Petroleum Industry Electrical Association in Shreveport, La., April 22-24, at the Washington-Youree Hotel. The program covered both technical and practical subjects regarding corrosion problems, according to Harry C. Gear, chairman.

Some of the principal speakers on cathodic protection were: William E. Huddleston, Cities Service Gas Co.; Donald H. Bond, The Texas Pipe Line Co.; R. A. Brannon, Humble Pipe Line Co.; L. F. Scherer, The Texas Pipe Line Co.; Ray M. Wainwright, Montana-Dakota Utilities Co.; and N. C. McGowan, President, United Gas Pipe Line Co.

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National Power Show Plans Are Now Being Formulated

Plans are developing rapidly for the 15th National Exposition of Power & Mechanical Engineering, scheduled for Grand Central Palace, New York, N. Y., Nov. 30 to Dec. 5, this year. As in the case of all previous National Power Shows, management is by the International Exposition Co., with permanent headquarters at Grand Central Palace, New York. Charles F. Roth is manager.

ABSTRACTS

• ABSTRACTS of papers presented at the American Gas Association Industrial and Commercial Gas Conference, Pittsburgh, Pa., March 12-13, 1942.

War-Time Relations with Our Industrial and Commercial Customers — J. P. Leinroth, Public Service Electric & Gas Co., Newark, N. J. The service the industrial gas engineer can render often goes much farther than that directly connected with heat application problems. For example, the dislocation of industry today often finds one plant looking for work while another plant is looking about for a company with which it can place orders on a sub-contract basis. Here the industrial gas engineer's knowledge of the plants in his territory can often result in bringing these two together. If it is important that industrial and commercial customers install the proper kind of equipment, it is no less important that the company man be on the ground to advise as to what kind of equipment to install. In too many instances, customers order equipment without a reasonable effort being made to check the type of equipment that should be bought; too often equipment is ordered without the company's knowledge; too often this equipment is not the type best suited for the purpose. This can only result in poor performance, dissatisfaction, and loss of prestige to the gas utility. It was never more important that the gas industry maintain a full complement of industrial gas engineers and that these men work harder, plan more carefully and be more alert than ever before.

Maintaining Quality Standards in War-Time Industrial Gas Equipment Purchases—Metal Treating and Melting Committee, Robert C. LeMay, chairman, The Connecticut Light & Power Co., Waterbury, Conn. It is the duty of equipment manufacturers, gas fuel salesmen and furnace engineers to see that war industries purchase or are supplied with industrial gas equipment which is modern, efficient and well suited to the immediate production needs and, when at all possible, also adaptable to probable post-war production. In general, the only war production plants that appear to avoid sub-standard equipment are those which employ competent fuel engineers of their own or whose policy it is to seek qualified outside advice. Details are given of typical sub-standard designs and practices.

Immersion Tubes for Industrial and Commercial Heating — F. E. Vandaveer, assistant director, A. G. A. Testing Laboratories, Cleveland, Ohio. In spite of the long and varied processes, most contemporary designs are empirically derived and based on accumulated experience. This is necessarily so in the absence of full fundamental data relating to heat transfer rates, combustion space, flue gas capacity, and other basic factors for the peculiar conditions involved in immersion heating applications. While this lack of technical data does not imply that present applications are unsatisfactory nor that present catalog data are being questioned, it does mean that some contemporary immersion heating methods are not as efficient or satisfactory as they might be, that manufacturers and engineers are hampered in development of optimum designs and applications, and that full utilization of this important principle of applying gas heat is not being realized. Recognizing the need for basic data on immersion tube heating, the Committee on Industrial Gas Research of the American Gas Association has initiated a fundamental research project on this subject. This assignment has been made to the A. G. A. Testing Laboratories and is designated as Project No. 47, "Research in Gas Immersions Heater Design and Operation." Laboratory work was started on this project the latter part of January. It is planned to divide the experimental work into three parts, using (1) atmospheric type immersion burners, (2) forced draft type immersion burners, and (3) induced draft immersion burners. On all three types of immersion heating, examination and testing of representative types of contemporary equipment will precede recording of handbook data and determination of effect of various changes in important variables on their performance. Such tests will include combustion, burner and pilot operating characteristics on manufactured and natural gases; study of factors affecting efficiency and heat transfer per unit area, length and diameter of tubes, and noise of operation.

Commercial and Industrial Salesmen Can Play an Important Part in Reselling the American Way of Business — T. M. Salisbury, Ebasco Services, Inc., New York, N. Y. Do everything that is humanly possible in helping to win the war. Make selling the American free creative enterprise system part of the program for 1942 and the duration. Take immediate steps to inform all in the organization concerning the American way of business. Establish objectives. Set up procedures to attain objectives. Set up a system of periodic reports which will show accomplishments as compared to the objectives. The difference between the accomplishment and the objective will be a continuous challenge for greater effort in this cause.

Design and Engineering Developments in Hotel and Restaurant Equipment—Edwin A. Jones, Majestic Mfg. Co., St. Louis, Mo. Discusses the present competitive position of hotel and restaurant equipment, concludes that present generally unsatisfactory designs of equipment are the result of too little competition, and predicts that post-war competition will force improvement in gas equipment and result in retention of gas as favorite cooking fuel. Gives a specific example of possibilities with a commercial gas cooking appliance, with a description of a gas counter griddle incorporating entirely new design features of cleanliness, heat control, uniform heat distribution, grease disposal, compactness and operating economy.

Competitive Conditions of Gas Versus Electric Deep Fat Fryers and Suggestions for Improving the Situation—Ray Trowbridge and Carl Linde, Seattle Gas Co., Seattle, Wash. Outlines competitive conditions in deep fat fryer market in Seattle during the past several years. The paper concludes that the greatest need is gas fryers of the immersion tube type comparable to the electric counter model and the general duty model both as to speed and selling price. Lists some actual selling experiences and appends a reproduction of Pacific Coast Gas Association's Gas Utilization Data Sheet No. 71, dated June, 1940, "Comparative Performance of Gas and Electric Deep Fat Fryers."

Industrial Gas Goes to War—Henry M. Heyn, manager, heat treating division, Surface Combustion Division of General Properties Co., Inc., Toledo, Ohio. A resume of typical advances in industrial gas technology during the past 24 years, which have contributed to the present opportunities and necessities for rapid war materials output—and an exhortation to continue such development even during present times of stress so that the problems of future peace can also be met.

Drying Processes With Gas Heat—Don D. Beach, Atlanta Gas Light Co., Atlanta, Ga. The gas drying load is desirable, since it peaks in the summer and since the applications are relatively easy and generally meet with customer satisfaction. A variety of uses and methods encountered in the drying field are described, giving a picture of gas applications to drying problems.

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• ABSTRACTS of papers presented at the 24th Annual Convention, Oklahoma Utilities Assn., Okla. City, Okla., March 23-24, 1942.

The Public Utilities and the Public —Elmer T. Petersen, *Daily Oklahoman and Times*, Oklahoma City, Okla. Public utilities should give thought to irritations Mr. John Q. Public experiences when he finds widely divergent service rules applied by gas and electric companies. Why would it not be smart for public utilities to agree on a uniformity of such rules and avoid much of the confusion and misunderstanding among their customers? Public utilities, especialy electric utilities, have been exposed to public ownership propaganda in recent years. Unimpeachable engineers have proven that steam power is much cheaper than water power. The TVA failed during the recent drought. The only way such projects can give the public low rates is to charge back a large part of the costs to flood control. In the face of the threat of an Arkansas Valley Authority, the utilities of Oklahoma can make history by convincing the public that they can generate electricity cheaper and more efficiently with steam power.

Public Utilities on the Battle Front of Democracy—E. H. Poe, secretary, Natural Gas Section, AGA, New York. Utility people do not resent any rule or regulation imposed by necessity for winning the war. This is one war in which every man, woman and child will have a part. Rapid growth of bureaucracy has resulted in disturbing economic theories which have been put into practice by law. Some individual and group freedoms have been restricted by these laws and industrial relations and kindred matters have been dangerously complicated. All Americans must have faith in our ability to restore civilization throughout the world. I am proud of the part public utilities are playing in winning the war so that this will be possible. After this war many industrialists will seek new locations for many new industries which will be created. These will be located nearer the sources of raw materials where labor's attitude is more friendly.

• **ABSTRACTS of papers presented before the New England Gas Association's 16th Annual Business Conference held in Boston, Mass., March 19-20, 1942.**

A Research Program for the Gas Industry—Harold Vagtborg, director, Institute of Gas Technology, Chicago, Ill. By establishing the institute, the gas industry circumscribed the technological service possibilities not already provided for by the A.G.A. Laboratories and technical committees. The A.G.A. Laboratories will continue on a larger scale to establish and maintain equipment and appliance standards and carry on research related to this program. The Gas Institute will complete the circle of organized facilities available to the industry by training men; by conducting fundamental and applied research; by collecting and disseminating scientific information; and coordinating research in the entire gas industry. Such a program will stimulate research, whether in a company laboratory or in the form of "farmed-out" projects, for the possibilities of duplication will be reduced. (See page 34.)

What About Restrictions?—Watson E. Derwent, president, The Association of Gas Appliance & Equipment Manufacturers and vice president, Geo. D. Roper Corp., Rockford, Ill. The restrictive measures will bring a full realization to the general public, and to every home owner, what this great program means and its effect upon them as individuals. Our problem, therefore, is to coordinate our efforts in the industrial groups, to the end that the greatest production and the greatest use of machine and man power can be brought about, and with no thought of limited hours in any day, week, month or year. We must also do the job of financing this tremendous program and without thought to the sacrifices we individually must make to bring about this accomplishment.

The New England Gas Industry and the War—Charles G. Young, president, The New England Gas Association, and manager, The Springfield (Mass.) Gas Light Co. Present indications are that new problems, due to unavailability of fuels, will soon occur. The problem of transportation is sure to have its effect on our raw fuel supplies and is likely to become most severe by next fall or winter. At a meeting held recently in Boston, it was decided that an informal committee should be set up to handle the presentation of the gas companies' fuel needs to such authorities as would be most helpful. This committee has been formed, under the chairmanship of Hall M. Henry, questionnaires have been sent out and, to date, considerable progress is reported.

The 1942 Home Appliance Market—Arthur P. Hirose, director of market and research, McCall Corp., New York, N. Y. Some factors that tend to stimulate appliance sales are increased employment, a higher national income, and the shortage of gas appliances for home use which is developing. Factors which tend to retard sales are "war-time unemployment" created by the conversion of peace-time industries to war work and the fact that the military effort has taken many men from civilian life, disrupting the maintenance and establishment of homes and placing them on a lower financial scale.

Free or Paid Appliance Servicing—James A. Cook, general manager, Lynn (Mass.) Gas and Electric Co. Paper tells origin of free servicing; how competition with other fuels is met by promotional rates; how suitable promotional-type rates justify and require paid appliance servicing; how war economy adds to need for paid servicing; and policy and experience of the Lynn Gas and Electric Co. Our competitors do not supply free servicing of their appliances. It is logical for the gas industry also to charge, at least in part, for servicing and repairing gas appliances. Customers should be billed for servicing and repairing appliances on a reasonable basis designed to fit a promotional type of domestic gas rate schedule which offers increasing use of gas at low unit cost.

Progress in the Manufactured Gas Industry—W. D. Gay, manager, utility department, Standard & Poors Corp., New York, N. Y. After a comprehensive study of 50 straight manufactured gas companies and 44 gas divisions of combination service companies, or 94 companies in all, it was possible to ascertain the 10 most profitable companies on the basis of (1) the return on net plant investment over a period of years, and (2) the ratio of operating income to gross revenue after taxes and depreciation. A careful appraisal of the 10 "best" companies permits the following conclusions relative to the reasons for their success: (1) They all served fairly large cities, which meant that they had relatively dense loads. (2) The service areas were in most cases rather heavily industrialized. (3) Weather conditions during the major portion of the year were generally conducive to heavy gas consumption. (4) The consumer purchasing power of the service area was well above the national average.

National and Industrial Survival—Erwin H. Schell, head of the department of business and engineering administration, Massachusetts Institute of Technology. The problem of national survival in its simplest form is a problem of acceleration. In point of national resources, no one questions that we have the fundamental wherewithal to implement our survival. The problem of industrial survival is cradled in the problem of the nation. But future security and continuance will be largely influenced by technical and scientific increase due indirectly to the war. War effort to be successful must be evolutional effort. Ingenuity, inventiveness, enterprise, research must be at the heart of every patriotic activity. A war or a peace is never won by doing the same thing over and over. We must do it better every time. Here is democracy's major weapon. To fail to use it is to commit industrial suicide.

GAS in this department each month presents reviews of technical magazine articles, new books, and individual reports presented before the association meetings of the gas and allied industries.

To do this, more than 70 periodicals serving the gas, oil, and affiliated industries are read each month by a competent editorial staff. In addition, the technical editor of GAS combs the individual reports given before association meetings for worthy material to be presented in this department.

Abstracts of gas industry association papers are published to save the reader's time, to furnish him with capsule information on contributions to gas association programs. The publishers of GAS will gladly forward requests for further information to authors of papers abstracted in this department.

The value of this department is amply demonstrated by the action of one of our technical readers. He has subscribed to an extra copy of GAS in order to cut out these items and paste them on 3x5 file cards for ready future reference.

The War Production Board Salvage and Scrap Speed-up Program—George Sutherland, utility coordinator, Industrial Salvage Section, Bureau of Industrial Conservation, War Production Board. The War Production Board has recognized the necessity of conservation of materials vital to the defense program and set up an official Bureau of Industrial Conservation. To the Industrial Salvage Section has been assigned the job of advising industry on salvage and reclamation problems and expediting the flow of both normal and dormant scrap through normal channels into the flow of materials urgently needed for defense. In the past three months, 170 trade associations have been enlisted in the program, reaching approximately 30,000 industrial plants. The gas industry can help by expediting the flow of normal scrap through regular channels and particularly by making up its mind to scrap that obsolete equipment that has been kept around for years on the basis that it "may be useful some day."

Business Planning for V Day—Malcolm P. McNair, chairman, Program Committee, Massachusetts Committee on Post-War Readjustment and professor of marketing, Harvard Graduate School of Business Administration. The chief reason for expecting a post-war business slump is precisely the existence of the expectation itself. Don't look on government planning as an enemy. It will have undesirable effects only if business itself fails to plan and fails to take a more realistic long-range view. Business planning for V Day must be grass-roots planning from the bottom up; it must be planning by private enterprise; by industries; by localities; for new products and new uses; in terms of large turnover, small profit per unit, and lowered prices; not for smaller production but for larger production, because it is this large production which is the only sound source of the buying power to carry off the products of industry and increase the standard of living.

A Survey of 1941 Public Relations Developments—Clark Belden, chairman, Public Relations Committee, American Trade Association Executives, 1939-1941. War conditions have made business leaders more aware of the force of the public opinion and of the necessity of frankness with the public as a basis for sound relations. Everybody who has anything to sell is looking for a reason to show how it will help the war effort if people buy it. The practice of public relations, far from being threatened, has assumed new importance in the national emergency. Many organizations are engaged in adjusting their public relations activities to new needs and new problems. A whole field of public relations dangers facing the gas industry which are based on the tempo and nature of today's living conditions mean at least two things: (1) that gas company business relations with customers cannot be normal in all respects, and (2) that people are not normal in their daily outlook and expectations.

Why the Gas Industry Needs Detailed Market Studies—Henry O. Loebell, vice president, Combustion Utilities Corp., New York, N. Y. After the war we probably will be confronted with a serious readjustment of business activity. That readjustment is bound to be difficult and have serious repercussions in every industry and, as well, will affect every individual. The speed with which this readjustment to peace activities will be accomplished will depend largely upon the plans and procedures developed prior to that time which can be put into play immediately after the present emergency is over. To prepare ourselves as an industry to meet our respon-

sibility when the time comes requires that we recognize some fundamental changes in living modes that are currently being created which will be the determining factors in the new order after this war.

Industrial Gas Keeps Pace—C. B. Phillips, vice president in charge of sales, Surface Combustion Corp., Toledo, Ohio. Our present industrial emergency is being handled by the developments that were brought about during peace time in the solution of regular peace-time pursuits. If we cannot sell gas now for domestic heating because of the necessity of using that gas for our war effort, we must so advise the public and keep them conversant with the part gas is playing toward the protection of their liberty. Remember, industry is composed of individuals and it is the individuals who compose the country. By serving, educating, truthfully explaining and convincing this public, we protect ourselves and our legitimate interests so that we can be and will be of further service to them in the days to come.

Testing Applicants for Employment, Transfer, or Promotion—Herbert W. Saul, director, guidance department, Boston Y. M. C. A. To use aptitude tests for selective purposes your test program must be built on the basis of research carried on in your own company. Essential steps are: (1) Use several different types of tests to measure the abilities and aspects of personality of your employees. (2) Analyze results, noting high and low scores. (3) Construct a special series of tests, designed to measure those traits and abilities which research has shown to be characteristic of the most successful of the workers tested in this specific job in your company. (4) Check up periodically on the results you are gaining with your tests, and revise your techniques accordingly.

New Problems for Your Accountants—E. F. Embree, auditor, New Haven (Mass.) Gas Light Co. The downward trend in earnings of utility companies as shown by the 1941 Annual Reports presents a very serious problem. Record-breaking sales are not being followed through with comparative increases in earnings. "Ceiling prices" imposed by rate regulation are proving their inadequacy to absorb the rising tide of uncontrollable operating expenses. With the expectancy of still higher taxes and the safe assumption of continued rising costs for fuels, materials and labor, it is obvious that even to hold earnings at their present level, there is only one inevitable conclusion; that the utility companies are in line for revenue relief.

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• ABSTRACTS of the papers presented at the meetings of the Wisconsin Utilities Association Gas Section Convention at the Schroeder Hotel, Milwaukee, Wis., March 16-17, 1942.

Emergency and Permanent Repair of Gas Mains Damaged by Bombs — G. E. Szekely, engineer, Dresser Mfg. Co., Bradford, Pa. Despite terrific bombardment, London gas companies have kept their systems in substantially continuous operation. Experience in England has shown that the distribution system is the most vulnerable portion of the gas companies' facilities and is most subject to severe damage. The principal causes of damage to the gas system are high explosive bombs, incendiary bombs, sabotage, and parachutists. Of these the high explosive bombs are by far the most devastating. Incendiary bombs are dangerous only if they chance to fall at a point where there is gas leakage, or score a direct hit. Direct hits are rare. Careful leak surveys and prompt elimination of leakage by means of efficient repair is the best means of combating the incendiary bomb hazard, in so far as the distribution system is concerned. Ample stocks of pipe and repair fittings should be kept in reserve at strategically located, well-protected storage points. One or more trucks should be kept loaded with a full complement of essential repair tools and material, prepared for any emergency. Emergency fittings for making rapid repairs to broken mains have been developed. (See *GA S*, Dec., 1941, p. 25.)

Revenue Recovery and Load Building After a Natural Gas Changeover — C. V. Sorenson, Northern Indiana Public Service Co., Hammond, Ind. Pictures the recent experience of three companies in revenue recovery and load building after a natural gas changeover. The companies faced individual problems and used different methods in meeting them. One company served 7000 residential meters, another 14,000, and the third, 27,000. With the introduction of natural gas each of these companies materially increased its residential sales efforts. No unusual plans for selling domestic equipment were employed. The most important part of each sales plan was man power and supervision. Sales crews were organized along the usual lines, on a salary and commission basis. It is essential to have faith that natural gas is a good product; that it will be accepted by the public; that it will meet competition; that it can be merchandised, and that you are offering a service for which the public is thankful.

Advantages of Natural Gas for Companies and Public—Dean W. Flowers, vice president and general manager, American Michigan Pipe Line Co., Muskegon, Mich. Lists the technical and operating advantages and disadvantages of natural gas as compared to manufactured gas, with the conclusion that "the advantages of natural gas over manufactured gas so far outweigh the disadvantages that it is a prudent and profitable thing for any company in any community to make the change where natural gas is available at a reasonable cost and with a reasonably good supply.

Wisconsin's Critical Gas Problem—Chairman R. W. Peterson, Public Service Commission of Wisconsin, Milwaukee, Wis. If it develops that the War Production Board will not grant priorities for the expansion of gas production plants, then that board should give consideration to the possibility of bringing natural gas into Wisconsin under the emergency powers of the Federal Power Commission in order to grant relief. If natural gas does become available it would seem only reasonable that the expenditure for the construction of plant additions which have been made during 1942 and thereafter until natural gas does become available should be allowed as a part of the utility's rate base until such time as the plant is retired or its cost amortized. We are not so interested at this time in a small difference in the cost of gas as we are in having a sufficient supply, whether it be natural or manufactured gas.

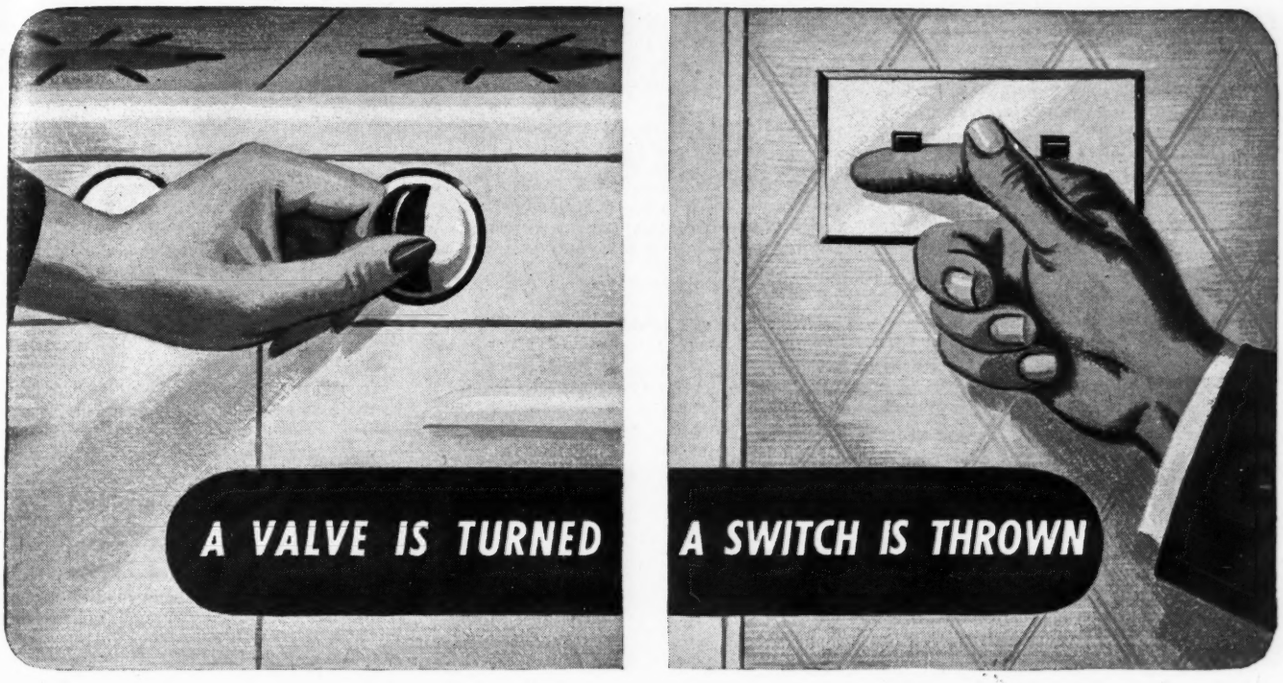
Some National Observations — George S. Hawley, president, American Gas Association, New York City. The American Gas Association is operating at highest efficiency, concentrating its efforts on those matters which are of prime importance in the successful prosecution of war. Adjustments have been and will continue to be made. Activities which have proved of great value in normal times must now be altered to fit prevailing conditions, but without unnecessary curtailment. There will have to be a realignment of emphasis, curtailment in some and expansion in other fields, as the conduct of the war exerts a greater pressure upon us—all to the end that the gas industry shall contribute its best toward winning the war.

To the national association, war is no new experience. Under able leadership it has always adapted itself to the special demands of the time, be it war, panic, or other social upsets, and it will do so in this conflict. It may not be generally known that the Association for over two years has been gathering valuable material from abroad covering the protection of plants, distribution lines and other facilities from air raids and other enemy action, including sabotage. This information was distributed to our members, and there was and is tremendous demand for it.

Distribution Problems Upon Delivering Dry Gases in Old Manufactured Gas Systems—Prof. O. L. Kowalke, chemical engineering department, University of Wisconsin. Natural gas and butane-air gas upon being substituted for manufactured gases eliminate certain problems in distribution, but also bring in other problems to take the places of the old ones. Consideration of the difference between manufactured gases on one hand and natural and butane-air gases on the other will aid in the discussion of the problems of distribution. The differences may be considered in three groups: (1) manufactured gas contains water vapor and a little free oxygen; natural gas and butane-air gases are usually free from water vapor and only the butane-air gas contains notable amounts of free oxygen; (2) manufactured gases contain condensible hydrocarbon gases that have distinctive and persistent odors; (3) natural gas and butane-air gas comprise no hydrocarbons that condense under the ordinary temperature and pressure conditions existing in these city gas mains; (4) manufactured gases have flame characteristics and air supply needs that differ from those of natural gas and butane-air gas.

Changing from Manufactured to Natural Gas—L. J. Willien, Public Utilities Engineering Service Corp., Chicago, Ill. In any changeover job, regardless of the size of the system, some thought and study should be made with respect to the following points: (1) survey of appliances in use, (2) procurement of necessary tools and materials, (3) hiring, training, and organizing men, (4) publicity and instructions to customers, (5) operating plans and method to be used in making the changeover, (6) scheduling the gas production during the changeover, (7) facilities for handling an increase in the number of complaints. Four different methods have been used in changing over from manufactured gas to natural gas. They are: (1) district of small zone method, (2) pressure changeover or raised pressure method, (3) intermediate method, (4) muscatine or Galpin method, consisting of preliminary adjustment of two top burners of stove only.

Sales Promotion and Advertising Policies for the Duration — W. J. Grover, director of marketing, Surface Combustion Division General Properties Co., Toledo, Ohio. While gas companies may not have very much to sell at the present time, they do have a great deal to advertise to protect markets and to shape public opinion, he asserted, citing (1) advertising in keeping with restrictions, (2) surveying of public opinion to show to what extent the public is thinking along the lines of electricity as the future cooking and convenience fuel, (3) development of the conservation of fuel theme, (4) development of the theme of the part that gas plays in the war effort, and (5) advertising through the employee and employee education.



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ABSTRACTS

Current Periodicals

Determination of Solubilities of Gases at High Temperatures and High Pressures by the Rotating Bomb—V. N. Ipatieff and G. S. Monroe. *Industrial and Engineering Chemistry*, Anal. Ed., Feb. 15, 1942, pp. 166-171. The results obtained show that the modified rotating bomb can be used to determine the solubility of gases at high pressures and high temperatures approaching the critical. The method applied to the determination of the solubility of methane in benzene indicates that pressure is the principal factor affecting the solubility. The effect of temperature is minor, becoming more noticeable at higher pressures. The solubility determinations of propane in benzene indicate that both temperature and pressure have a marked influence on the solubility.

Subsurface Pressure Regulation of High-Pressure Condensate Wells — J. O. Farmer. *Oil and Gas Journal*, Feb. 26, 1942, pp. 66, 68, 70. Discovery of deeper reservoirs under higher pressures has resulted in the need for control equipment to preserve and protect these great sources of energy; also, means of preventing freezing or the solidification of hydrates, caused by throttling or restricting production, are required. The development of a successful removable subsurface pressure regulator has enabled operators to reduce dangerously high flowing pressures at the surface to safe working limits. By transferring the principal point of pressure reduction from the surface to warmer subsurface levels, elimination of the freezing conditions in flow lines can be accomplished.

Exhaust Gas, Dew Points, and Engine Lubrication — Bill Maddock. *Power Plant Engineering*, Feb., 1942, pp. 64-66. Calculation of air requirements and products of combustion for all common fuels burned in boilers or internal combustion engines reduced to a matter of simple arithmetic by a new and complete data table. Determination of the dew point of exhaust gases for boiler or engines simplified by means of a new chart. Effect of condensation from exhaust gases on lubrication, cylinder wear, and corrosion of internal combustion engines investigated at higher jacket water temperatures.

Practical Corrosion Tester for Chemical Engineers—M. H. Heeren. *Chemical & Metallurgical Engineering*, Feb., 1942, pp. 126, 127. Author has developed a corrosion measuring machine that goes far toward duplicating plant-scale operating conditions. It was designed primarily to determine the collective effects of heat, oxidation, galvanic corrosion, and other factors on metals, but it also has been used advantageously on nonmetals. This machine should be invaluable to the chemical engineer attempting to determine the most satisfactory material from which to construct a piece of equipment.

Formaldehyde from Natural Gas— H. A. Levey. *Chemical Industries*, Feb., 1942, pp. 204-206. All of our formaldehyde, until recent years, came from the process using catalytic oxidation of methanol. New developments in petroleum technology, and the emergency, however, result in still larger quantities being produced from natural gas supplies for industry.

Code for Pressure Piping — Sabin Crocker. *Heating, Piping and Air Conditioning*, Jan., 1942, pp. 1-5. Part 1. Since the ASA code for pressure piping was first issued as a tentative standard six years ago, there have been many developments and advances in piping practices. Welded joints have assumed increasing importance, standard dimensions for various types of fittings have been established and have come into common use, new rules and qualification tests have been formulated, and refrigeration piping has developed because of the growth of air conditioning and the older refrigerating applications. These and other factors have been among the changes which ASA sectional committee B31 has considered and incorporated in the new draft of the code for pressure piping in order to keep it abreast of the times. In this group of articles the new code, which soon will be a full American standard, is described and discussed in detail.

Dew-Point Recorder Protects Gas Line From Freezing—J. A. Setter. *Oil Weekly*, Jan. 5, 1942, p. 33. To prevent condensation of moisture and possible freezing of its gas lines during the winter months, Colorado Interstate Gas Co., which furnishes Denver with natural gas from Texas fields, has built a novel dew-point recorder utilizing a photo-electric relay. This equipment consists of a small tank filled with anti-freeze solution into which is immersed a U-shaped highly polished gold-plated tube. Through this tube passes a continuous flow of natural gas from a by-pass valve in the main pipe line. Both ends of the tube are provided with plate-glass windows. Above the windows, a light source and a photo-electric relay are mounted so that the light shines through the tube and is reflected to the phototube.

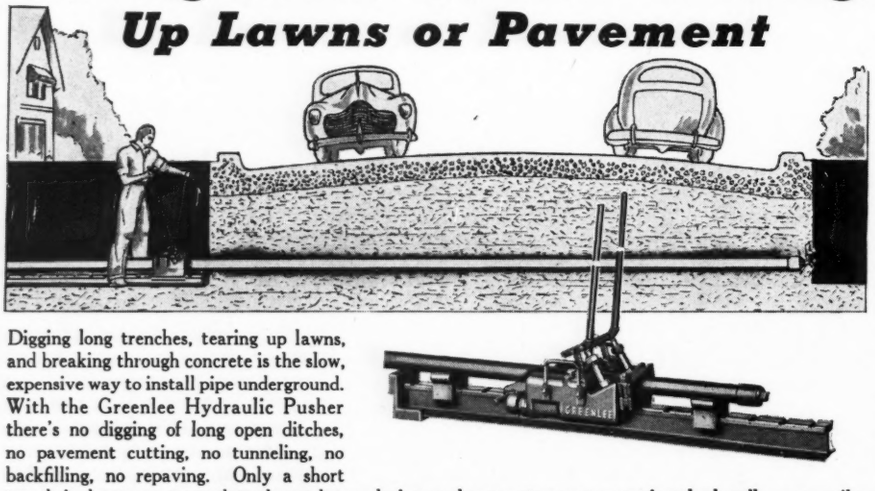
Asphalt Protective Coatings for Steel Water Pipes—A. H. Benedict. *Engineering News-Record*, Feb. 26, 1942, pp. 327-329. To establish a satisfactory specification for asphaltic coating that can be relied upon to protect steel pipes, the Asphalt Institute made a fundamental analysis and an exhaustive series of tests. The resulting specification is such as can be met by any well-equipped refinery. The specification is given.

Design Elements Affecting Safety — J. W. Lord. *Society of Automotive Engineers Journal*, Jan., 1942, pp. 1-6. Discussing the characteristics of vehicle design that make them hard to drive, fatiguing to operate, difficult to maintain, and disliked by drivers and mechanics, and the remedies thereof, the author takes up first cabs with poor visibility and with insufficient headroom for driver comfort. Continuing, he takes up factors that cause drivers to fall asleep and over-violent pitching of the cabs, and presents the results of a careful study made to find the optimum location for mirrors. Heating and ventilation, location and operation of controls with emphasis on braking and safe vehicle lighting are other important subjects discussed.

Preparation of Methyl Chloride from Natural Gas—*Oil and Gas Journal*, Feb. 12, 1942, pp. 33-35. Thousands of tons of methane are produced annually in the form of natural gas. Obviously, this would make a cheap and plentiful hydrocarbon for the preparation of many more complex hydrocarbons of commerce. In this article the research work of a Russian laboratory is summarized, in which the operator replaced one of the hydrogen atoms with chlorine to make methyl chloride, the material which could serve as a reactive vase component for preparing hundreds of such compounds.

A Practical Application of Zinc Anode Protection to an 18-in. Pipe Line.—C. L. Brockschmidt. *Petroleum Engineer*, Feb., 1942, pp. 74, etc. Successful protection of pipe line in highly corrosive river bottom provides data for improvement in future installations.

Here's How You Can Install Pipe Underground Without Tearing Up Lawns or Pavement



Digging long trenches, tearing up lawns, and breaking through concrete is the slow, expensive way to install pipe underground. With the Greenlee Hydraulic Pusher there's no digging of long open ditches, no pavement cutting, no tunneling, no backfilling, no repaving. Only a short trench is dug to accommodate the pusher and pipe, and one or two men pumping the handles can easily push pipe under sidewalks, streets, highways, embankments, and railroad tracks. No extra power equipment of any type needed . . . the powerful hydraulic units do the actual pushing. The Greenlee No. 790 Pusher will push 1¼ to 4-inch pipe, while the No. 795 Pusher, with a 75-ton hydraulic unit, will handle large drainage ducts, concrete sewer pipe, and pipe beyond 4-inch. Both Greenlee Pushers are built compactly into one unit, are easily carried to the job, and can be set up in a jiffy, ready for use. Write today for more information and learn how these Pushers can save you time and money on every pushing job.

Send for PUSHER BULLETIN S-117

GREENLEE TOOL CO.
1945 COLUMBIA AVE., ROCKFORD, ILL.

SUNBEAM

FOR WAR HOUSING!

There's a right type and size of **SUNBEAM** *Gas-Fired Unit for every type and size of home!*

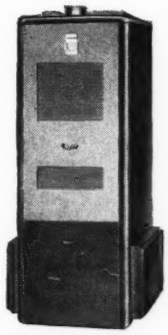
SUNBEAM Gas-Fired Units are designed for the special needs of low-cost war housing where fuel regulations permit—engineered to the specifications of various Governmental agencies—for individual homes and rows of houses—with and without basements.

Both units shown are of steel construction—compact, dependable, economical. Both have jackets of Placid Two-Tone Blue with distinctive **SUNBEAM** name plate.

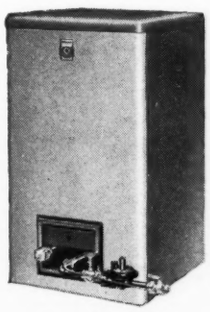
The complete **SUNBEAM** line includes Gas-Fired Furnaces and Winter Air Conditioners in a variety of types and sizes. For modernization, time payments available in accordance with U. S. Government regulations.

Our ability to furnish these products, as well as the products shown in our catalogues, is subject to the needs of the War Program.

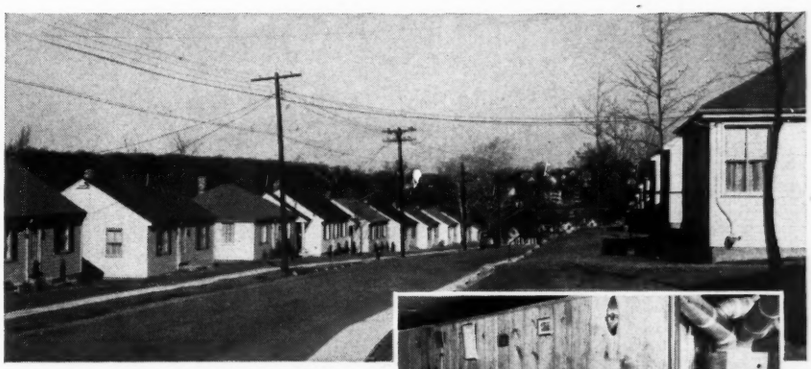
Point of Pines, Revere, Mass. William J. L. Roop, pioneer in low-cost housing—chose **SUNBEAM** Gas-Fired Winter Air Conditioners for these cellarless homes. Inset shows space-saving closet installation, easy with slip-joint jacket assembly and flexibility of Wyandotte's return air arrangement.



WYANDOTTE SU-70
Gas-Fired Winter Air Conditioner



SHAWNEE SG-80
Gas-Fired Gravity Furnace



Hazelwood Park, Hyde Park, Mass. 250 additional 6½ room war housing units now being added to this project by K. V. Wolsey Co. Each includes **SUNBEAM** Gas-Fired Furnace—already proved in previously completed section of the development. Shawnee's compact cleanliness literally adds another room to the house!

AMERICAN RADIATOR & Standard Sanitary
New York **CORPORATION** *Pittsburgh*

Cast Iron & Steel Boilers & Furnaces • Radiators • Cast Iron Enameled & Vitreous China Plumbing Fixtures & Plumbers' Brass Goods • Winter Air Conditioning Units • Water Heaters • Heating Accessories

★ ★ FIGHT FOR VICTORY. ENLIST NOW IN THE U. S. SERVICE ★ ★

Year-Round Air Conditioning in New Orleans

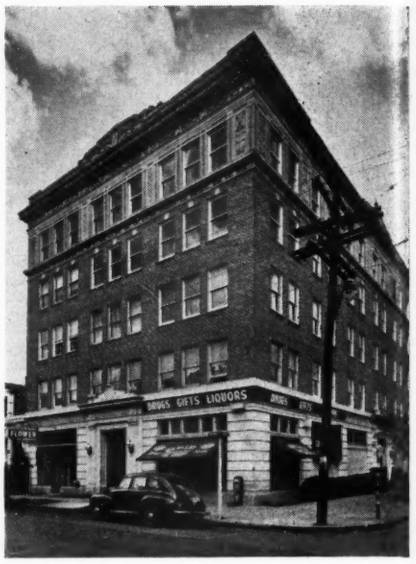
By BERT R. MERRILL

ACCEPTANCE of year-round gas air conditioning in New Orleans is demonstrated by the selection of Servel 5-ton heating and air conditioning units for winter heat and summer cooling in the new Ochner Clinic, which remodeled the former Physicians and Surgeons building in the Prytania Medical Center district.

Twenty 5-ton units have been used to cool five floors through the building, which houses the offices and examination rooms of specialists in pediatrics, obstetrics, minor surgery, eye, ear, nose and throat diseases, gynecology and other advanced medical interests.

One hundred tons of cooling capacity is distributed over the five floors by means of a "zoned" arrangement whereby each unit heats or cools approximately 1400 sq. ft. of office or floor space on each level. There are four zones to each floor. Each presents a varying heat load problem for air conditioning. This is due to many of the physician-tenants of the building observing only short office hours and using their rooms only two or three days a week, while many of the other offices contain laboratories which are used over the weekend throughout the year. Sporadic demand for conditioning thus presented the problem of providing a flexible type of heating and air conditioning. Gulf Engineering Co., Servel air conditioning dealers of New Orleans, were able to solve this problem by setting up twenty individual conditioning systems through the building.

A low-cost heating and cooling equipment room was provided for each floor by walling up a former 12x14 foot light shaft down the rear of the building. Four 5-ton gas air conditioning units are arranged two to a side in these, connected with the zone which they serve with insulated, diminishing ducts. The number of offices or rooms per floor varies from 20 to 35; consequently, each duct has a different number of grilles, one per room where offices are small, two or three for larger treatment rooms and laboratories.



New home of Ochner Clinic in New Orleans in which twenty 5-ton Servel air conditioners have been installed.

A normal summer temperature of 78° with 55% relative humidity is controlled by duct-face thermostat controls at each grille, allowing each tenant to switch on heat or cooling when the room is in use, shutting it off when leaving. Booster blowers provide for wider circulation of cooled air in the two zones at the front of the building, served by ducts 110 ft. in length from the building rear.

When only one zone in the building is occupied, a single unit can provide efficient cooling, whereas with a central cooling plant, it would require operation of the entire system. Thus, although the Servel installation amounted to approximately $5,000 more for initial installation, it is anticipated to save $1,800 per year in operating cost through this high flexibility.

The twenty units are cooled by a 400 gpm. cooling tower atop the building roof, and are easily available for repairs or service with convenient housing at the rear of each floor.

Gulf Engineering Co., first independent retail dealership appointed by Servel for air conditioning units, has also sold 30 systems for residential heating and cooling in the Louisiana city, replacing central coal or gas furnaces in each case. Three smaller physician's clinics have been equipped with gas air conditioning, as well as the offices of New Orlean's largest brewery.

O. E. DEMPSEY
CONSTRUCTION CO.

Pipe Line Contractors

WE HAVE THE EQUIPMENT AND PERSONNEL TO DO YOUR JOB!

Any Size - Anywhere
Call the Major Companies About Us

309 Kennedy Building
TULSA, OKLAHOMA

"Things are looking better, my dear," *said a prominent gas company official*

A FAMILIAR PORTRAIT OF A "WARMTH FRIEND" OF YOURS

Just to remind you there's a great day coming when we'll be telling you again, "Your load is as good as the appliance you sell. Sell the best . . . sell Ward Floor Furnaces!"

The other night a certain gas company executive we know took his nose out of the news and his ear from the air and gave out with an amateur fireside chat along these lines:

"My dear," said he to the Missus, "things are looking much better. Our side is beginning to hit Hitler hard and Tokyo has learned the meaning of *Remember Pearl Harbor*. The Russians are giving the Nazis the rush. The British aren't waiting for those bluebirds. Chinese courage has changed the meaning of a 'Chinaman's chance'. MacArthur and the other boys in uniform are getting set for big doings . . . and Don Nelson says war production is really turning out the stuff.

"But before the war is won things will get much tougher for us at home. We'll part with more than the cuffs on our trousers and the give in our girdles. We'll have to make things we have do for the duration.

"Speaking of that," says he, "I'm glad our company has sold dependable, durable appliances. Like those Ward Floor Furnaces, for instance. There's heating equipment that's a satisfaction. Practically never needs attention. No burning up our rubber on service calls. No tax on our maintenance men. Those Wards go right on minding their business, burning gas sparingly, giving warmth where it's wanted, without waste. They'll do for the duration . . . and longer. They'll last a lifetime . . . and I don't mean Hitler's."

WARD HEATER CO., LOS ANGELES

Thirty-two years of service to the gas industry

Our field men are on the job to serve you every way they can:

FACTORY REPRESENTATIVES: A. S. KINCAID, *Southern Manager*, P. O. Box 5, Dallas, Tex.; J. H. STUBBINS, 300 E. 68th Terrace, Kansas City, Mo.; H. C. SANDERSON, 1301 Clark Bldg., Pittsburgh, Pa.; L. E. KIRKPATRICK, 1700 15th St., Denver, Colo.; LEON M. TAYLOR, 3200 Main St., Dallas, Tex.

PEOPLE

Dave Cowden, purchasing agent for Arkansas-Louisiana Gas Co., Arkansas Fuel Oil Co. and Arkansas Pipeline Corp. for the last six years, has been promoted to head of the companies' service department with the title of service manager, according to an announcement made by **D. W. Harris,** vice president and general manager of the Arkansas companies. Mr. Cowden, whose office is in Shreveport, La., succeeds **J. Lucas.**

DAVE COWDEN

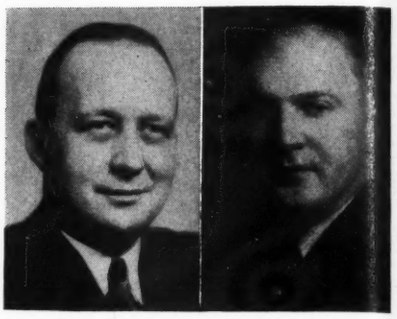
The new manager, who served in the navy during the first World War, joined Cities Service as an employee of the Empire Gas and Fuel Co. in Arkansas in 1921. Four years later he was transferred to the Natural Gas and Fuel Corp. and sent to Tullos, La., as gang and tool pusher, serving under **A. H. Weyland,** now general superintendent of the Arkansas companies.

Mr. Cowden served in this capacity until 1928, when he went to Shreveport to work in the warehouse division. Since then he has been successively superintendent of the transportation department, assistant purchasing agent and purchasing agent.

Mr. Cowden, as manager of the service department, will have supervision over all telephone, automobile and truck transportation, purchasing and warehouse facilities of the Arkansas Natural companies, in all the properties.

• •

Jones & Laughlin Steel Corp., Pittsburgh, Pa., has announced several changes in its district sales offices. **C. M. Mason** has been appointed district sales manager in Cleveland, Ohio, succeeding **E. A. France,** who has retired after 37 years of service with the company. **E. H. Hughes** has been appointed sales manager in Buffalo, N. Y. **G. G. Marshall,** who has been with the Buffalo office since 1934, has been appointed district sales manager there. **L. S. Berkey** has been appointed district sales manager in St. Louis, Mo. **E. S. Lewis** has been appointed resident manager of sales in Toledo, Ohio. **P. B. Turner** has been appointed manager of export sales in New York, and **W. R. Spindler** has been appointed assistant manager of export sales.



E. J. MEAD EUGENE J. STERN

E. J. Mead has been appointed vice president of the Atlanta (Ga.) Gas Light Co. and affiliated utilities, succeeding **Eugene J. Stern,** who recently resigned to become president of the Scripto Manufacturing Co. of Atlanta. Mr. Mead, who resigned as president of the Roanoke (Va.) Gas Co. and its associated companies in Virginia and Tennessee to go with the Atlanta company, began his career in the gas utility field in 1921 with the Kirk Gas and Smelting Co., Iola, Kan. Later he became associated with the Oklahoma Natural Gas Co. at San Angelo, Texas, and in 1938 he became vice president and general manager of the Consolidated Gas and Electric Co.'s properties. Mr. Mead was made president of the Roanoke company in 1940. Mr. Stern has been connected with the Atlanta company for the past 10 years. He started in the gas utility field as gas engineer for the Alabama Power Co., Phenix City, Ala., later becoming assistant division manager of the western division of the Southern Cities Public Service Co., with headquarters in Montgomery.

• •

E. M. De Remer, for a number of years general supervisor of industrial sales in Southern California Gas Co., has resigned his position in the gas company to become an engineer in the Fluor Corp. of Los Angeles, effective May 1. In his new capacity he will specialize in problems connected with the oil and gas industry, including design, engineering and construction.

Mr. De Remer, a graduate of California Institute of Technology, pioneered in the sale of natural gas for industrial processes in Southern California during his career with the gas company, and through active service on gas association committees, is recognized as an authority in that field.

He is succeeded in his gas company capacity by **R. B. Grossman,** former commercial sales supervisor.

Another member of the Southern California Gas Co. sales supervisory staff, **L. W. Tannehill,** who has specialized in heating and air conditioning problems, has also resigned to become consulting engineer with the Holmes and Narver Co. of Los Angeles. Mr. Tannehill will work on defense housing heating and ventilating projects.

• •

R. W. McClenahan, manager of the Philadelphia, Pa., factory of American Meter Co., has been granted a leave of absence to join the United States Army as a Major. Mr. McClenahan was appointed assistant manager of the factory in 1932 and manager in 1936. Active in research concerning meter maintenance and performance records, Mr. McClenahan presented the paper, "Factors and Trends in Meter Maintenance," before the 1935 A. G. A. Distribution Conference.

Service to Industry

The responsibility for increasing the production of the materials necessary to win this war is the responsibility of everyone who serves Industry.

The services of Webster Combustion Engineers are quickly available to those desiring consultation and assistance concerning gas burning installations.

THE WEBSTER ENGINEERING CO.

TULSA *Division of* OKLAHOMA

SURFACE COMBUSTION CO. . . . Toledo, Ohio

F. J. Evans Engineering Co., Birmingham, Atlanta and Houston

Catlett Engineers, Inc., Dallas Frank P. Fischer Engineering Co., New Orleans

Charles E. Norton, of Evanston, Ill., vice president and treasurer of Norton-McMurray Manufacturing Co., Chicago, Ill., was ordered to active duty April 14 in the Cincinnati Ordnance Department with the rank of Major. Major Norton graduated from Cornell University, class of 1919, with an M. E. degree. He has had 23 years of varied engineering experience.

C. E. NORTON

This included his position as assistant development engineer with the National Aniline & Chemical Co. in development of high-pressure continuous filtration equipment and mercury vapor processes.

Following this, he was vice president of the Hanley Co., Bradford, Pa. His next position was as design engineer of the Dresser Manufacturing Co. of Bradford, Pa. In 1938 Major Norton joined F. A. McMurray in the formation of the Norton-McMurray Manufacturing Co. of Chicago.

• •

R. G. Soper, president, Dallas (Texas) Gas Co., is a member of the board of directors for the United China Relief solicitation which opened campaign offices in the Tower Petroleum Bldg., Dallas, on March 28.

• •

The appointment of **Joseph T. Wright** as manager of the compressor and tool division at its Holyoke, Mass., works is announced by Worthington Pump and Machinery Corp.

Mr. Wright served as assistant works manager of Lodge & Shipley Machine Tool Co. during World War I, subsequently organized J. T. Wright Co. of Cincinnati for the manufacture of paper drilling machines and other special equipment. This organization subsequently merged with Harris-Seybold-Potter Co., Dayton, Ohio, with which organization Mr. Wright served in various capacities.

• •

C. E. Gill, formerly in charge of gas odorizing activities of Sharples Chemicals, Inc., Philadelphia, Pa., has resigned his position with Sharples in order to develop the distribution and sale of a new warning agent for fuel gas called Captan. The organization formed to handle Captan is the Natural Gas Odorizing Co., in Baton Rouge, La. Mr. Gill will make his headquarters in the company's Chicago office.

• •

R. W. Ducker, general superintendent, Oklahoma Natural Gas Co., Tulsa, Okla., has been called to Washington for special duties in the Office of Petroleum Coordinator. He was granted an indefinite leave of absence effective April 1.

• •

D. B. McGregor, treasurer of the Arizona Edison Co., Inc., Douglas, Ariz., has been transferred to the Phoenix office of the company. A former resident of Phoenix, Mr. McGregor came to the Douglas office in 1936.

• •

The Petroleum Coordination Office announced April 15 the appointment of **Kenyon L. Reynolds** of Pasadena, Calif., as chief of the section for natural gas and natural gasoline for the Pacific Coast district.

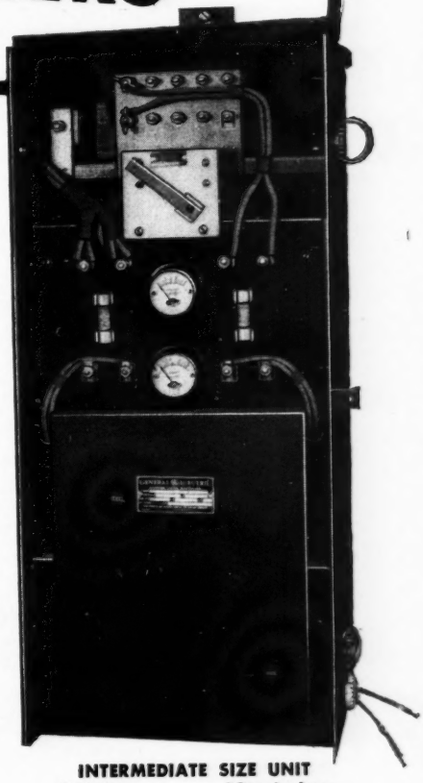
• •

Norris C. McGowen, president, United Gas Pipe Line Co., Shreveport, La., is among 34 Louisianians listed for the first time in the 1942-43 "Who's Who in America."

Control Corrosion Efficiently

WITH

G-E CATHODIC PROTECTION RECTIFIERS



- double wall construction prevents direct internal absorption of the sun's heat.
- bottom location of air intake and exhaust helps to make casings weathertight.
- exhaust downdraft keeps intake screen free of insects and moisture penetration.
- fan-cooled construction permits smaller size and weight for a given rating and lowers the cost per watt output.
- units fitted compactly into tall narrow casings facilitate pole mounting.

INTERMEDIATE SIZE UNIT
Height..... 29⅝ inches
Width..... 12½ inches
Depth..... 12 inches

THERE IS A COMPLETE LINE TO CHOOSE FROM

Casing sizes.....3
Ratings 22
D-c. volts ..... from 3 to 21
D-c. amperes .... from 7 to 130
Output watts..from 63 to 1640

For more information on G-E Cathodic Protection Rectifiers, just write to Section A-5210-85, Appliance and Merchandise Dept., General Electric Company, Bridgeport, Connecticut.

GENERAL ELECTRIC

Robert W. Miller, president, and **Robert A. Hornby,** vice president of Pacific Lighting Corp., San Francisco, Calif., have been commissioned as Captain and Major, respectively in the Army and ordered to duty on the headquarters staff of **Major Gen. R. G. Cousins,** commanding officer of the West Coast Air Corps Training Center. The headquarters are at Santa Ana, Calif., but their duties will take them to the many training fields of this command, located in four states. Mr. Miller and Mr. Hornby will be granted leaves of absence by the company under its policy of granting such leaves to all employees entering the armed forces. Their duties will be assumed by **C. O. G. Miller,** chairman of the board, **LeRoy M. Edwards,** vice president and general manager, Los Angeles, and executives of the operating companies in Los Angeles. Mr. Miller reported for duty in March (*GAS*, April, p. 51), and Mr. Hornby reported on April 11.

ROBT. A. HORNBY

• •

After 48 years of continuous service with the Harrisburg (Pa.) Gas Co., **William H. German,** office manager in charge of accounting, retired last month. He was succeeded by **Harold S. Rand,** formerly with the United Gas Improvement Co., Philadelphia, Pa. Mr. German was the oldest employee in point of service in the company. He entered the firm's employ as a meter reader and advanced through various positions in the accounting department until he became office manager. He was a member of the Office Management Committee of the American Gas Association and was identified with the Pennsylvania Gas Association.

• •

D. A. Hulcy, president, Lone Star Gas Co., Dallas, Texas, and **R. G. Soper,** president, Dallas (Texas) Gas Co., will serve on the Civilian Defense Council's sub-committee on public utility preparedness headed by **Clyde L. Stewart.** The sub-committee will coordinate the programs of public utilities in guarding against sabotage, preparing for enemy attacks and other emergencies and meeting the needs of civilians and defense industries. Mr. Hulcy was named to serve on the sub-committee on defense training, the sub-committee on new defense industries, the sub-committee on public works for defense, and the sub-committee on defense housing.

• •

Appointment of **H. M. Brundage** as chief of a newly created Appliance Section in the WPB Plumbing and Heating Branch was announced recently by **W. W. Timmis,** chief of the branch. Before going to the War Production Board, Mr. Brundage had managed his own business, the H. M. Brundage Co., in Richmond, Va. Previously he had been general sales manager of the Washington (D. C.) Gas Light Co. and was prominently identified with American Gas Association activities. Mr. Brundage attended Stevens Institute of Technology.

• •

Albert W. Collen, former sales promotion manager of the Ohio Fuel Gas Co., Toledo, Ohio, has been named engineer in the Toledo office of the War Production Board.

Guy C. Garrison, for the past 10 years gas distribution engineer, Gulf States Utilities Co., Baton Rouge, La., has been named gas engineer, handling the sale of Pentalarm for Sharples Chemicals, Inc., Philadelphia, Pa., succeeding **C. E. Gill,** resigned, according to an announcement of **N. J. Hooper,** general sales manager of the company. Mr. Garrison, who attended Louisiana State University prior to becoming associated with the utility company, will make his headquarters in Chicago. His basic experience with Gulf States will enable Mr. Garrison to cope with the odorization problems of gas utilities.

GUY C. GARRISON

• •

Judge Robert W. Otto, former member of the Supreme Court of the State of Missouri and former Attorney General, has been elected vice president of The Laclede Gas Light Co., St. Louis, Mo., by the board of directors of that company. Judge Otto was recently elected a member of the board. He has been general counsel of the company since 1932.

• •

James R. Abrams, formerly advertising director of the Domestic Gas Range Division of the Association of Gas Appliance Equipment Manufacturers, is now employed by the Weston Electrical Instrument Corp., Newark, N. J., in industrial relations work. Mr. Abrams was associated with Congoleum-Nairn, Inc., from 1933 to December, 1940.

■ ■

WILLIAMS BROTHERS CORP.

PIPE LINE CONTRACTORS

OIL - GAS - GASOLINE - WATER

Also Heavy Construction

CHICAGO • TULSA • ATLANTA • HOUSTON

Obituaries

E. D. Laudeman

Edward D. Laudeman, 70, who was retired in January 1941, with a service record of more than 50 years with the Cincinnati (Ohio) Gas & Electric Co., died March 31 in Indianapolis. From 1891 until 1925 Mr. Laudeman was superintendent of West Gas Works. In the latter year East Gas Works was put into operation and he took over there as superintendent. From 1934 until retiring he was plant engineer.

• •

Moore Robinson

Moore Robinson, of the American Gas Association Testing Laboratories, died recently, following a short illness. He had been employed continuously in the maintenance department since May, 1926. Mr. Robinson was born in Belfast, Ireland, in 1897 and came to the United States 18 years ago.

• •

Louis Christiansen

Louis Christiansen, 83, former superintendent of the Wisconsin Public Service Corp.'s gas plant at Oshkosh, recently passed away. He began work in 1887 and retired in 1936.

• •

H. C. Griffith

H. C. Griffith, 41, district branch manager of the Foxboro Co., Houston, Texas, died suddenly at his home in Houston February 7. He was associated with Foxboro since 1930.

T. J. Reynolds

Thomas J. Reynolds, secretary-treasurer of the Geo. D. Roper Corp., Rockford, Ill., died suddenly April 16. Mr. Reynolds went to work for the Geo. D. Roper Corp. in 1910. He progressed from clerk in the purchasing department to assistant purchasing agent in 1915 and to purchasing agent in 1917. In 1929 he became secretary-treasurer of the company. In addition to carrying out his duties with Roper, he also acted as assistant secretary-treasurer of the Blackhawk Engineering Co., Roper subsidiary whose production is devoted exclusively to Army Ordnance. Mr. Reynolds was a Master Suppler and a charter member of the Guild of Ancient Supplers.

• •

G. T. Bradley

Gore T. Bradley, 62, in charge of all operations of Equitable Gas Co. in southwestern Pennsylvania, died April 10 while attending a meeting of the Production Division of American Petroleum Institute in Hotel William Penn, Pittsburgh. Mr. Bradley, who began working with the company 45 years ago, was appointed superintendent of the West Virginia division in 1922 and went to Waynesburg, Pa. in 1932.

• •

E. T. Fishwick

Edward T. Fishwick, vice president and director of the Worthington Pump and Machinery Corp., Harrison, N. J., died on March 15 at his home in Glen Ridge, N. J. Mr. Fishwick had been with the Worthington organization for 49 years, having started with the corporation at its Cincinnati works. Mr. Fishwick was senior vice president of the corporation; president and director of the Worthington-Gamon Meter Co. of Newark, N. J.; a director of the Glen Ridge Trust Co.; a director of the New Jersey State Chamber of Commerce, and was formerly head of the Diesel Engine Manufacturers Association.

• •

W. F. Suess

Willard F. Suess, 45, general supervisor of gas power sales, Southern California Gas Co., Los Angeles, died April 4. Mr. Suess attended the University of Colorado and joined the Southern California Gas Co. at Redondo in 1923. In 1928 he was transferred to San Bernardino as division sales supervisor, and in 1933 he was promoted to power engineer in Los Angeles. In 1935 he was advanced to the post which he held at the time of his death.

• •

F. G. Small

Fred Glen Small, 50, owner of the New York advertising agency of that name, died at his home in Rockville Centre, N. Y., March 24, following a brief illness. Mr. Small spent 25 years in the advertising profession, specializing in industrial accounts. His clients included General Ceramics Co., New York, N. Y., and Vulcan Proofing Co., Brooklyn, N. Y.

• •

D. L. Wishon

David L. Wishon, 81, manager of the Bakersfield (Calif.) district, San Joaquin Light and Power Corp., from 1918 until his retirement in 1937, died recently.

The Gulf South . . . That's the Place

. . . Where Loyal, Intelligent Citizens and Unlimited Resources Speed Up War Production

The Gulf South has rolled up its sleeves—speeding up war production—for World Peace!

The people of the Gulf South recognize their duty to do their utmost in the present crisis. They are intelligent and industrious, and want to help utilize the rich, diversified resources of the Gulf South in meeting increased war production requirements.

Further, the Gulf South offers your industry other advantages —quick, convenient transportation by land, sea and air—good schools—plentiful land—ideal living and working conditions in a pleasant year-round climate, and a superb fuel—Natural Gas—ever available for industrial use.

Let us give you more information on the Gulf South in relation to the requirements of war production and peacetime markets. Without obligation we will be glad to make a survey for you. Your inquiry will be kept strictly confidential.

For information on* GULF SOUTH *opportunities, write to

UNITED GAS
PIPE LINE COMPANY

FOR TEXAS, mail received at: Beaumont, Beeville, Dallas, Fort Worth, Houston, Longview, San Antonio and Wichita Falls. FOR LOUISIANA, mail received at: Baton Rouge, Lake Charles, Monroe and Shreveport. FOR MISSISSIPPI, ALABAMA and FLORIDA, mail received at: Jackson, Mississippi.

Buy U. S. War Savings Bonds and Stamps . . . Help Win the War

★★★ "Keep'em frying" ★★★
with PITCO Frialator

CONSERVES FAT - GAS - SPACE
USE PITCO FRIALATORS

Your interests in saving fat, gas and space for Uncle Sam are identical with ours as well as every restaurant, hotel, club, cafeteria, lunchroom and diner in the nation. Stop each and every profit leak which is an automatic conservation plan.

PITCO FRIALATORS are not only a highly satisfactory dividend payer, but you can depend on them to *Conserve Fat*—speed up meal production—utilize gas efficiently—combat competition . . . and they produce a constant excellence of quality that is not obtainable otherwise.

You—and every other gas executive—are vitally interested in war-time economies and gas conservations. Write us for information on the cooperation which we are extending to the Gas Companies.

J. C. PITMAN & SONS, INC., 711-719 Broad St., Lynn, Mass.

Oklahoma Natural Expands for Flexibility

IN order to keep up with the swiftly changing scenes in the picture of gas reserves and markets in Oklahoma, the Oklahoma Natural Gas Co., Tulsa, Okla., has planned a construction program to improve its transmission system.

Tulsa, once located in the center of one of the state's prolific gas fields, has not only seen its nearby gas supply entirely depleted, but is watching the known reserves move farther and farther away. As the gas supply has been decreasing, the problem of transportation to the market has been increasing. Where once gas was piped from the Tulsa area to Oklahoma City, the flow of gas has been reversed and gas is brought to Tulsa through the lines formerly used to bring it to Oklahoma City.

Because of this shifting of the location of reserves, the Western division of Oklahoma Natural's system, with 51% of the total sales, has an open flow of 1,860,000,000 cu. ft. of gas connected; while the Eastern division, with 49% of the sales, has only 900,000,000 cu. ft. of open flow in connected wells.

An extensive construction program has been planned (some of which is already completed — See *GAS*, October, 1941, pg. 66 and November, 1941, pg. 26) which will increase the flexibility of the company's transmission system and provide additional gas supply for the Eastern division markets.

Since the summer of 1940, 62 miles of 6-, 10-, 12-, and 16-in. pipe line have been laid by Oklahoma Natural which has increased the capacity of the transmission system by about 25,000,000 cu. ft. per day. Of this total, approximately 18,000,000 cu. ft. will be available to the Eastern division.

Besides these improvements, the company has continued to extend its lines to proven gas reserves in order to insure an adequate supply of gas to its consumers and to the many defense industries recently constructed in the state.

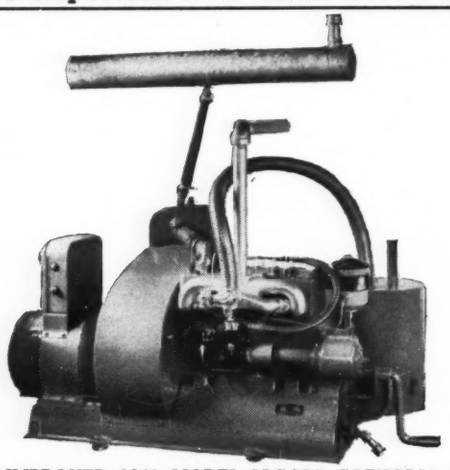
■ ■

Williams Co. Is Distributor

The J. A. Williams Co. of Pittsburgh, Pa., has acquired the distributorship in the tri-state area of the complete line of Grand gas ranges for Cleveland Co-operative Stove Co. of Cleveland, Ohio, according to W. C. McClelland, sales manager for the Williams Co.

CATHODIC PIPE LINE PROTECTION

More Important Now Than Ever Before



NEW IMPROVED 1942 MODEL JACOBS CATHODIC UNIT
IMMEDIATE DELIVERY AT PRESENT

Designed to Operate on Natural Gas, Butane or Gasoline

This new improved 1942 Model 4-cylinder special Pipe Line Cathodic Plant is designed to meet any requirements from 1000 to 5000 watts, with a voltage range of 10 to 40 volts. (Higher voltage available on order.) Maximum ampere output 150.

The slow operating speed, 600 to 800 r. p. m., insures years of service. Other specifications such as Fram oil filter, extra large 5-gallon oil crankcase reservoir, super size special design oil type air cleaner, heavy duty Scintilla Magneto, special extra heavy duty spark plugs, automatic radiator condenser (operates many months without additional water) and automatic fuel shut-off in event of low oil, overheating of engine or generator failure, insure maximum operation and protection with a minimum of maintenance service.

Immediate delivery can now be made. Anticipate your future requirements as far as possible because future delivery schedules and prices cannot be assured.

Write for Complete Literature and Prices

THE JACOBS WIND ELECTRIC COMPANY, Inc.

PIPE LINE DIVISION
MINNEAPOLIS, MINNESOTA
America's Leading Manufacturer of Pipe Line Cathodic Plants

New Appliance Connector Requirements Are Available

THE American Gas Association Testing Laboratories issued recently its proposed American Standard listing requirements for gas appliance connectors of flexible metal tubing and fittings to all manufacturers of such equipment. They will become effective January 1, 1943.

The requirements represent initial standards developed for this type of accessory. Development of flush-to-wall type domestic gas ranges indicated a need for more flexible type of gas conduit than formerly available to permit more convenient attachment to house piping. Prepared in anticipation of increasing demands for such products, the requirements cover gas appliance connectors of braided or non-braided flexible all-metal tubing of ½-in. to 1-in. nominal internal diameter designed for this purpose.

Manufacturers may submit their products for test under these new standards in advance of the date on which they become effective. By such instances, Certificates of Listing will be dated as of January 1, 1943, rather than at the time of completion of test as is customary. Additional information may be obtained from the A. G. A. Testing Laboratories, 1032 E. 62nd St., Cleveland, Ohio.

■ ■

Stanpac Gas Line Will Be Converted To Crude Oil Line

An A-1-A priority has been obtained for the necessary materials to convert the Stanpac gas pipe line into a crude oil line, thus making the refineries in the San Francisco (Calif.) bay district independent of ocean transportation. The project is sponsored by Pacific Gas and Electric Co. and Standard Oil Co. of California.

The Office of Petroleum Coordinator announced that the conversion will require only a small amount of steel and will cost approximately $1,500,000. Communities which are now getting their gas from this line will be served by the Rio Vista gas field east of San Francisco in the future.

The part of the Stanpac line which is to be converted runs from Kettleman Hills into the bay area. The pipe line varies in size from 22-in. to 26-in. It is estimated it will deliver 100,000 barrels of crude per day.

■ ■

Milwaukee Solvay Coke Co. Is New Name of Corporation

The stockholders of The Milwaukee (Wis.) Coke & Gas Co. have recently adopted a resolution amending the articles of incorporation so as to change the name of the corporation to "Milwaukee Solvay Coke Co.," according to an announcement from J. A. B. Lovett, president of the company.

The change of name has now become effective. This amendment, however, does not affect the identity of the corporation, which will continue as heretofore with the same personnel.

■ ■

Coast Counties Gas Rates Cut

The California Railroad Commission has announced a reduction of between 12.4% and 12.7% in the gas rate charges of Coast Counties Gas and Electric Co., effective January 15, 1942. The commission estimated the reductions would result in savings of $191,500 a year for consumers in the eight counties served by Coast Counties gas lines.

Ranney Drilling Experiment Scheduled To Commence in Pennsylania Soon

THE first commercial-scale installation of the Ranney method of combination mining and drilling, with the drilling to be done horizontally, will soon begin in Pennsylvania. This experiment will be much in advance of anything yet done, according to the Independent Petroleum Association of America.

The method to be used will combine the drilling of horizontal wells into the sand by means of special equipment devised in recent years and has been given preliminary testing in southeastern Ohio. Some 16 Pennsylvania and New York oil producing companies and individuals are stockholders in the Venango Development Corp., recently organized to install and operate this form of mining.

Leo Ranney, mining and petroleum engineer who designed and patented the equipment for drilling oil wells horizontally, is the technical advisor to the company. The Pennsylvania test will be made in Venango county near Franklin. The shaft will be dug to the oil sand and will be about 400 ft. deep. The pattern of wells from the bottom of the shaft, when completed, will be that of the spokes of a wheel and the penetration into the sand of each horizontal well can be carried out hundreds of feet, states Mr. Ranney.

■ ■

John Zink Co. Adds Pattern Shop, Other Facilities to Tulsa Plant

John Zink Co., Tulsa, Okla., manufacturers of oil and gas burners for heating and power plants, also floor furnaces and unit heaters, recently constructed their own pattern shop, casting plant and foundry to facilitate and speed the manufacture of the line.

The new building housing the foundry is 60 ft. by 100 ft. in dimension. A maximum of 40,000 lbs. of castings per week are cast in the foundry by the 25 men employed. Clifford Lawrence, foundry foreman, is shown in center inspecting a mold just formed for a burner that will go into a 100 octane forming furnace. The John Zink Co. employs a total of 75 people.

■ ■

Gas Shortage In England Will Probably Lead to Rationing

A recent editorial note in "The Gas Times," London magazine serving the British gas industry indicated that gas will be rationed in England in the near future. Because of the acute nature of the coal situation, domestic consumption of all fuels will have to be reduced 25%, stated Hugh Dalton, president, Board of Trade, recently.

To conserve gas supplies and because of shortage of fittings, The Dublin Gas Co. has discontinued the laying of gas pipes to Corporation houses. For almost a year now no new gas stoves have been released, and new cookers can be obtained only by exchange for second-hand ones.

■ ■

"Servel News" Combines House Organs

The first issue of "Servel News" was published on April 1 by Servel, Inc., Evansville, Ind. The publication combines the several house organs of the company into one. One of the feature articles in the initial issue was titled "Making America Strong," by G. H. Noble, managing director, National Committee on Boys' and Girls' Club Work. The article was scheduled to tie in with the National 4-H Club Mobilization Week, April 5-11. It may also be used by dealers in connection with the war program generally, and particularly with the national nutrition program.

Normac Bell-Joint Clamp partly open. Method and product covered by U.S. Patents, Nos. 2,163,261 and 2,178,286.
Quick
Easy
Permanent

NORMAC BELL JOINT CLAMPS give you the most modern and efficient method of handling leak repairs. To begin with, they reduce pavement cutting to practically a post hole size job. A twelve-inch clamp goes through a foot square hole. That saves time and makes friends with the public. A simple set of specially designed tools cleans the joint and installs the clamp. Frequently the joint can be cleaned and clamp installed complete in a quarter of an hour. Best of all, the repair of joint and pavement is permanent. Available in all sizes. They are in use today by large as well as small gas companies in all parts of the country. Let us send you complete details. Illustrated literature will be sent at your request.

NORTON-McMURRAY MANUFACTURING COMPANY
Manufacturers of the "NORMAC" Line of Gas Distribution Equipment
COMPRESSION-END METER BARS • • SLEEVES • • COMPRESSION-END COCKS
• BELL JOINT CLAMPS • • • COUPLINGS • • • SERVICE TEES and ELLS •
39 SOUTH LA SALLE STREET • CHICAGO, ILLINOIS

Three Companies Ordered To Cut Natural Gas Rates

THE Federal Power Commission has directed the Canadian River Gas Co., Amarillo, Texas, to reduce wholesale natural gas rates by $561,000 annually; Colorado Interstate Gas Co., Colorado Springs, Colo., by $2,065,000 annually; and Colorado-Wyoming Gas Co., Denver, Colo., by $119,000 annually in termination of rate proceedings instituted in March, 1939. Of these amounts, which total $2,745,000, amounts aggregating $649,000 are duplicated due to transactions between the three companies.

Under the Commission's orders, a reduction of $655,000 annually is ordered in the wholesale rate at which Colorado Interstate sells gas to the Natural Gas Pipe Line Co. of America, Chicago, Ill., for transmission to the Chicago area, which leaves a net total of $1,441,000 available to be passed on to ultimate consumers in Colorado, northeastern New Mexico and southern Wyoming. Under the orders the reductions shall be reflected in all bills regularly rendered on and after May 15, 1942, by Canadian River Gas Co. and Colorado Interstate Gas Co., and all such bills regularly rendered on and after June 15, 1942, by Colorado-Wyoming Gas Co.

■ ■

Houston Gulf Gas Co. Will Discontinue Service June 12

Formal notice to the Houston (Texas) Gulf Gas Co. to discontinue service as of June 12 to the city-owned Magnolia Park gas plant. was given last week by the Houston City Council. The City Council has entered into a new contract to buy gas at the gate from Frank M. Corzelius, Industrial Gas Co., at 11c per 1000 cu. ft. compared with charges of 20c and 15c now paid. The lower rate is being used by Mayor Pickett as a wedge for obtaining lower rates to the general public served by Houston Natural and United Gas Co.

■ ■

Petroleum Reserves for 1941 Totaled 2,000,000 Barrels

The petroleum industry found 1,968,963,000 barrels of new oil during 1941, or 564,781,000 barrels more than the 1,404,182,000 barrels of crude oil produced during the year, the American Petroleum Institute's Committee on Petroleum Reserves has announced.

The net increase raised total known underground reserves of petroleum as of January 1, 1942 to 19,589,296,000 barrels. Total reserves on January 1, 1941 were 19,024,515,000 barrels.

Most of the new oil was added through upward revisions of reserves in fields found prior to 1941, however. Further development of older fields revealed a net addition of 1,538,989,000 barrels of crude oil which had not been included in previous estimates for those fields due to incomplete development.

■ ■

Gas Generator in Minnesota

Contract for the construction of a gas plant generating building in Virginia, Minn., by the City Water and Light Commission, has been awarded to Lenci and Englund of that city.

18,000 Miles of Hole Were Drilled by Oil Men in 1941

AMERICAN oil men in 1941 drilled more than 18,000 miles of hole. Depths of individual wells range from a few hundred feet to nearly three miles. The number of deep wells, drilled to more than 10,000 ft., has been increasing spectacularly since the first one was completed in 1931, but the average depth of all wells has moved only a few feet up and down from 3000 ft. in the last 15 years.

Since 1931 the petroleum industry has drilled 1044 wells below 10,000 ft., 668 of them in 1940 and 1941. At the end of 1941, 60 others scheduled to pass 10,000 ft. were still drilling.

Most of the deep fields developed by these wells produce crude oil of extremely high gravity, which is very useful in the manufacture of super aviation motor fuels. Thirteen new deep oil-producing formations were discovered in 1941.

Two-thirds of the deep wells were drilled in Louisiana, which had 244 completions below 10,000 ft.; Texas had 74, California 39, and Alabama, Michigan, Mississippi and West Virginia one each.

■ ■

PUAA Convention Set For June 22-23 in New York

A large display of representative utility advertising which has been run since Pearl Harbor will be a feature of the Public Utilities Advertising Association meeting, to be held June 22-23 in New York City. The idea behind this "How they've done it since Pearl Harbor" display is credited to Al C. Joy, Pacific Gas and Electric Co., San Francisco, Calif., and president, PUAA.

PUAA members have been instructed to select the best samples of their advertising that has been run since Dec. 7, 1941, and send it to Charles W. Person, AGA, 420 Lexington Ave., New York. Deadline for receipt of material is June 15. Mr. Person is chairman of the exhibit committee and will be assisted by Howard F. Weeks. Clara H. Zillessen, Philadelphia (Pa.) Electric Co., is first vice president of the association.

■ ■

Colorado & Wyoming Cities Ration Gas Following Flood

Rationing of natural gas and cutting off fuel for cooking and heating in a dozen Colorado and Wyoming cities became necessary on April 19 following the giving away of a Lone Star Gas Co. (Dallas, Texas) pipe line which served the communites wth gas from the Texas fields before record-breaking flood waters engulfed the area two days previous. The torrent came rushing down the normally dry Sorrumpa Creek, 20 miles northwest of Clayton, N. M.

The natural gas shortage sharply reduced consumption in Denver and other Colorado cities, and the supply for Cheyenne, Wyo., Greeley, Fort Lupton and Brighton, Colo., was shut off entirely.

■ ■

Louisiana Camps Need Gas

Utility officers of Camp Livingston and Camp Beauregard (La.) have requested an additional 10,000,000 cu. ft. of gas daily from the City of Alexandria, La., and Mayor W. George Bowden has asked the Southern Gas Line Co., Inc., Monroe, La., who has the contract to furnish fuel for Alexandria, for the increased gas supply.

B AND M CONSTRUCTION CORPORATION

BUILDERS OF PIPE LINES FOR THE OIL AND GAS INDUSTRY

DURING THE PAST YEAR HAVE WORKED MAINLY ON NATIONAL DEFENSE PROJECTS WITH HIGH PREFERENCE RATING.

SOUTHERN NATURAL GAS COMPANY
22" Loop Line through Louisiana, Mississippi, Alabama and Georgia

THREE NATIONAL DEFENSE PROJECTS:

CAMP GRUBER . . . Oklahoma

MIDWEST AIR DEPOT . . . Oklahoma City

UNITED GAS CORPORATION . . . Austin, Texas

General Offices:

316-319 Petroleum Building, Phones 7-8844 — 8-2685

OKLAHOMA CITY, OKLAHOMA

Earl A. Benson, President Wm. V. Montin, Secretary-Treasurer

For over 57 years Roper has been a leader in the field of gas cookery. A steady parade of constant improvements has kept Roper gas ranges the favorite with housewives the nation over.

Roper has always contributed much to our national welfare. Today Roper gas ranges continue, cooking wholesome nourishing foods, to maintain national health and morale. This job is important.

We are giving every possible aid to our nation in the present emergency. Vital war materials are being manufactured on an all-out schedule.

★ *Buy Defense Bonds* ★

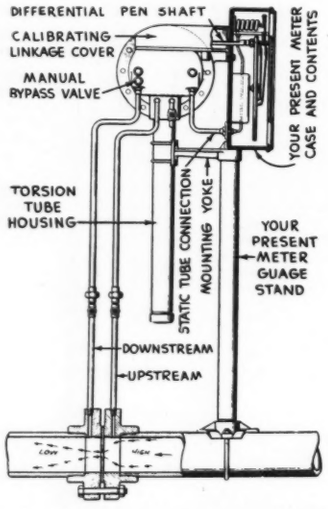
ROPER A PILLAR OF THE GAS INDUSTRY FOR OVER 57 YEARS

GEO. D. ROPER
CORPORATION
GENERAL SALES OFFICE AND PLANT: ROCKFORD, ILLINOIS

ROPER SPEEDS PRODUCTION FOR DEFENSE!

Roper Gas Ranges For All Type Gases Including (LP) Liquefied Petroleum Gas

Convert
EXISTING
ORIFICE METERS
to Mercury-Less Operation with the
New
ARCCO-MACNICK
Differential UNIT

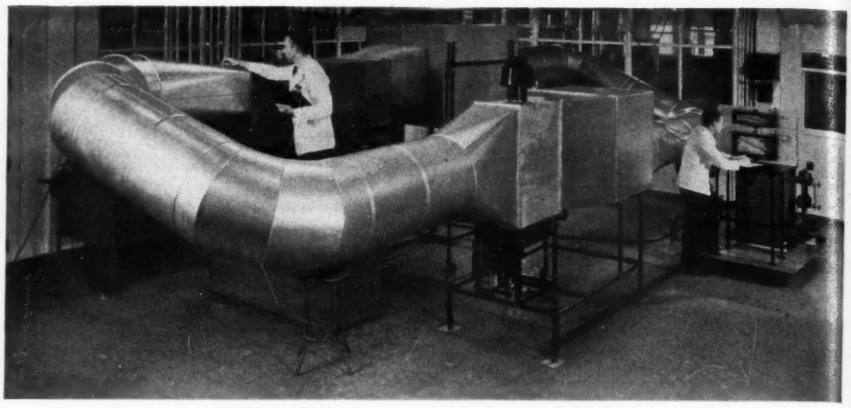


Don't weep over spilled or unobtainable mercury—just unbolt the mercury chambers from your existing meter gauges and install Arcco-Macnick Differential Units instead. This universal unit fits nearly all types of orifice meter cases — uses NO MERCURY or other liquid columns — measures the differential pressures existing across orifice meter plates, orifice fittings, venturi tubes and other contracted tube metering devices. No change in charts, accounting, or chart calculating procedure. Meter case and contents undisturbed. Friction, wear, and leakage eliminated. All calibrating done outside of pressure chamber.

Send for Bulletin No. 112 Today!

AMERICAN RECORDING CHART CO.

3113 E. 11th Street Los Angeles, Calif.
510 South Lansing Avenue Tulsa, Okla.



Test rack for determining refrigerating effect of gas summer air conditioning units. Model under test is in left rear with orifice and plenum chamber compartment at right rear; at right front is steam boiler for humidity control, and instrument panel. In compartment at front center is blower and duct heater for air flow and temperature control.

Air Conditioning Equipment Tested

SUMMER temperature and humidity conditions duplicated by mechanical means are now being employed at the American Gas Association Testing Laboratories in conduct of research in gas summer air conditioning equipment. Fig. 1 shows a complete assembly including a unit under test. It embodies recommendations of the American Society of Refrigerating Engineers and is used to determine cooling effect of a gas summer air conditioner. It is capable of producing practically any temperature and humidity condition desired.

Forming a completely enclosed system, humidified and heated air simulating any range of summer air temperatures and moisture conditions is supplied by means of a steam boiler and gas-fired duct furnace shown at the right rear and front center. While the amount of water vapor is controlled manually, air temperatures are automatically controlled through the duct furnace which is also equipped with a variable speed blower. The large duct through which the air is passed to the model under test at the left rear is also equipped with adjustable baffles and louvres for final adjustments of the rate of flow. The refrigerating effect and rate of air flow is measured by means of an orifice at the outlet of the plenum chamber shown in the rear center. The pressure gages employed may be seen in front of the steam boiler. These products are then recycled. Two of the outstanding advantages of this test rack is its ability to attain equibirium operating conditions with a reasonable speed and its ease of control regardless of ambient conditions.

Conducted under the supervision of the Technical Advisory Committee on Summer Air Conditioning Research, a subcommittee of the Joint Committee on Summer Air Conditioning, the test is only a small part of a comprehensive research program undertaken at the Laboratories since April, 1941. Already several progress reports have been made available. When sufficient data have been obtained, they will be summarized and distributed to the industry in bulletin form. Additional information may be secured by addressing the American Gas Association Testing Laboratories, 1032 East 62nd Street, Cleveland, Ohio.

■ ■

Natural Gas Shows Gain as Important Energy Source

Petroleum and natural gas energy rose from 31% to 42% of the total energy available from 1929 to 1940, while coal decreased from 66% to 54% during the same period, a report of the Bureau of Mines reveals. The 1940 total almost equaled the amount available in 1929, the peak year.

The bureau report cautions that no attempt is made to equate these fuels and power sources on any basis except B. t. u. content, and further that for many uses they are not competitive. Less than one-half of the output of petroleum and about one-half of the production of natural gas are strictly competitive with coal, the report states.

■ ■

Mineral Industries Gallery Opened, Penn State College

A new Mineral Industries gallery was formally opened at Pennsylvania State College, State College, Pa., April 11. The collection, epitomizing the basic mineral industries of Pennsylvania, includes nearly 150 oil paintings, water colors, prints and drawings. Scenes of towering oil and natural gas rigs are depicted in the collection, which was brought together by Dean Edward Steidle and other members of the faculty of the School of Mineral Industries.

REED VALVES

HAVE

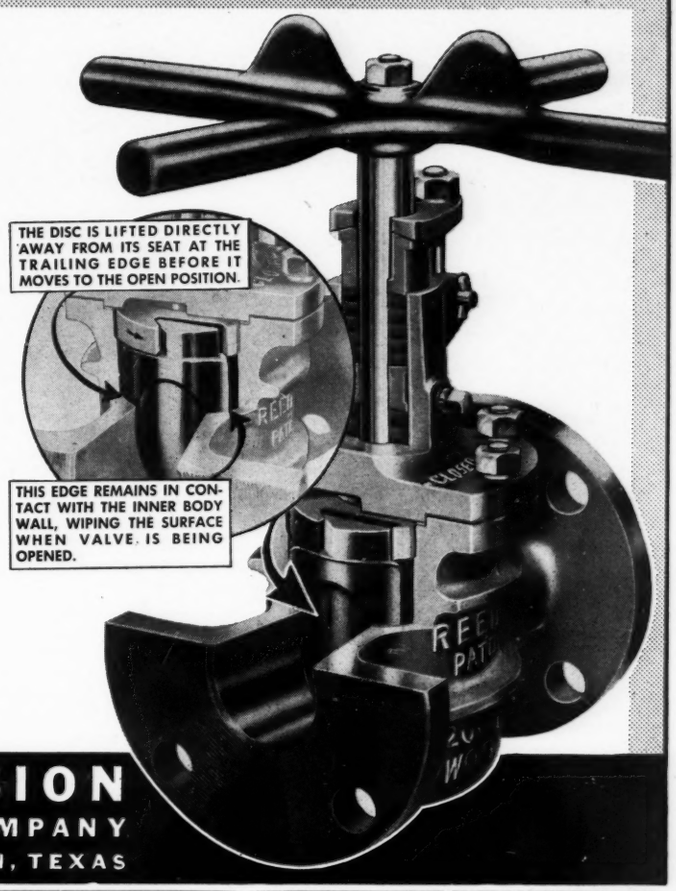
Exclusive features

WHICH ASSURE

EASE OF OPERATION
LONG SERVICE LIFE
LOW MAINTENANCE COSTS

The lifting action of the seating disc provides ease of operation at all times and the cleaning action of the leading edge of the disc, plus the through-conduit in the disc holder, reduces erosion of the seats to a minimum and assures a tight seating valve in any service.

Send for REED Valve Catalog 41, NOW!

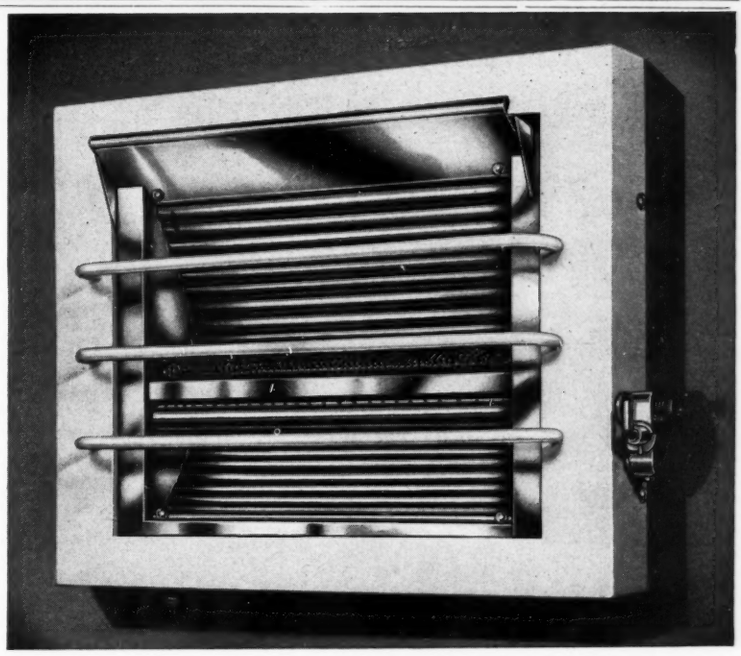

THE DISC IS LIFTED DIRECTLY AWAY FROM ITS SEAT AT THE TRAILING EDGE BEFORE IT MOVES TO THE OPEN POSITION.
THIS EDGE REMAINS IN CONTACT WITH THE INNER BODY WALL, WIPING THE SURFACE WHEN VALVE IS BEING OPENED.

REED VALVE DIVISION
of the REED ROLLER BIT COMPANY
P. O. BOX 2119 HOUSTON, TEXAS

They're SINGING AGAIN *IN THE* BATHROOM

There is good reason, too for feeling like a lark. That old bug-bear "Bathroom-chill" has been chased away from hundreds of homes by the cheery comfort of a Humphrey Rafire Wall Heater. This smartly styled, low priced heater makes friends on sight and keeps them forever.

YOUR trade will enjoy the instant, economical heat that a Rafire Wall Heater provides. Write today for complete literature.



Humphrey Rafire Wall Heater

GENERAL GAS LIGHT COMPANY
KALAMAZOO, MICHIGAN
23 Warren St., NEW YORK CITY 2nd Unit Santa Fe Bldg., DALLAS 475 Eleventh St., SAN FRANCISCO

How to Make Your Advertising HELP Our War Effort

Advertising Has to CHANGE To Work TODAY!

FREE MANUAL, NOW READY, SHOWS HOW

90 PAGES OF PRACTICAL HELP

Demonstrates, by example, how your advertising, too, can help fight the war; help customers; help build a sound foundation for future business.

Want FACTS? No chronicle of theories and opinions, this. "A Guide To Effective War-Time Advertising" is a factual report based upon the testimony of business leaders who have found ways to make their advertising *helpful* to their customers and prospects at a time when help is so desperately needed. It shows, too, how "oversold" companies now use "service advertising"; how they do as the business paper editors do . . . *use their space to transmit important information from where it is to where it is needed.*

Examples of Sound, Shirt-sleeve Advertising. After you read this "Guide," you will have a new concept of what advertising can do to help America's war effort and to help your company solve its customer-relations problems, present and future. *And you will know what good "institutional" advertising is!* The Guide features advertisements that show some recognition of the conditions which today have *increased* rather than lessened the need for making business paper advertising *useful, informative* and *specific.*

This Guide, while comprehensive in itself, is only our introduction to a collection of case studies that will constitute a veritable WAR ALBUM. Send for it now and you'll receive additional up-to-the-minute case studies, free, as fast as they're produced.

We Have to Use EVERYTHING WE'VE GOT To Win This War!

Good business papers are multi-purpose carriers that can convey important messages quickly, accurately, economically, to special groups of men with kindred war-time problems. America, the world's greatest user of these vehicles of business communication, has a powerful tool to use against the Axis. By making the best possible use of business papers now, we can strike a blow that will be felt across both oceans.

"A Guide to Effective War-Time Advertising" will help you do this. One copy is yours for the asking . . if you'll ask before they're all gone.

FREE

GAS, 1709 West Eighth Street
Los Angeles, Calif.

ABP

Please send, without obligation, my free copy of "A Guide To Effective War-Time Advertising."

NAME.....

POSITION.....

COMPANY.....

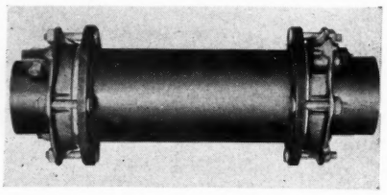
STREET.....

CITY & STATE.....

PRODUCTS

Bomb Crater Clamp

M. B. Skinner Co., South Bend, Ind.
Model: Skinner-Seal Bomb Crater Clamp.
Application: For quickly repairing mains where a gap has been blown out by an explosion.



Description: Makes a tight, lasting connection between the ends of the broken main and a random piece of steel pipe cut to appropriate length, to fill the space. Illustration shows how connection is made between main and steel pipe at each end of gap. Left end makes connection with main; right end makes connection with steel pipe. Flanges, welded to center tube, act as anchor rings for bolts.

■ ■

Asbestos Suit

Mine Safety Appliances Co., Braddock, Thomas and Meade Sts., Pittsburgh, Pa.
Model: M.S.A. One-Piece Asbestos Protective Suit.
Application: Designed to provide instant and complete personal protection against flame hazards in emergencies.
Description: The manufacturer states that the suit consists of an upper-and-lower durable asbestos garment securely sewed together, with helmet, gloves and boots attached to completely enclose and protect the wearer. The unit prevents the entry of flame, insulates against heat, guards the head from injury by falling or flying material and enables speedy and effective work at the scene of emergency. The suit is made in a universal size only with tabs at each side and back to adjust length. For complete information write the manufacturer for Bulletin No. CF-7.

■ ■

Gas Slide Rule

Utilities Distributors, Inc., P. O. Box 1937, Portland, Maine.
Model: UDI Gas Slide Rule.
Application: To aid gas engineers, service men or salesmen in solving the following problems: Pressure drop in regulators, pipe lines, meters, control valves, etc.; orifice capacities in cubic feet of B. t.u. per hour at pressures from .01 in. to 300 lbs. per sq. in.; burner port capacities and burner design; correlation of pounds, cubic feet and B. t. u.'s for LP-Gases; water heating costs and multiplication and division as with the common slide rule; problems in connection with any type of gas may be solved provided the specific gravity of the gas is known.
Description: The UDI Gas Slide Rule is a duplex rule with two movable slides, is equipped with an indicator and comes in an attractive and durable leather case. Dimensions: 12½ in. by 2⅝ in. by ¼ in. The rule is made of seasoned mahogany and covered with celluloid. A 48-page manual and instruction book is included with each slide rule which shows many problems completely worked out. There are 100 exercises with answers in the back of the book. The manual includes instruction on the use of the common slide rule, tables, formulas and other data of use to gas men.

■ ■

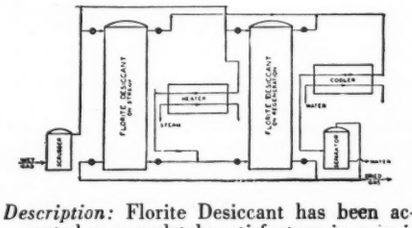
Valve Control Unit

The Foxboro Co., Foxboro, Mass.
Model: Remote Valve Control Unit.
Application: For the manual control of remote valves, dampers and other pneumatically operated equipment.
Description: Unit harmonizes with the rectangular case in which Foxboro recording and controlling instruments are now available. When the unit is flush-mounted, its front surface is only 7/16 in. from the surface of the instrument panel, and as its setting knob and pressure indicator are recessed, there are no protruding parts to suffer accidental bumps.

■ ■

Granular Drying Agent

Floridin Co., Inc., 150 Liberty St., Warren, Pa.
Model: Florite Desiccant.
Application: A new granular drying agent for gases and liquids.



Description: Florite Desiccant has been accepted as completely satisfactory in a variety of industrial processes requiring bone dry gases and liquids and also has proved economical in many installations where high drying efficiency is not ordinarily demanded, states the manufacturer. Among products now being successfully dehydrated are natural gas, propane, gasoline, air, nitrogen, and carbon dioxide. Florite Desiccant absorbs water instantly and will not swell, disintegrate, or appear wet at the end of an adsorption cycle. It absorbs 4% to 20% of its weight in water, depending on the particular application, and is regenerated by heating to 300-350° F.

■ ■

Blackout Bulb

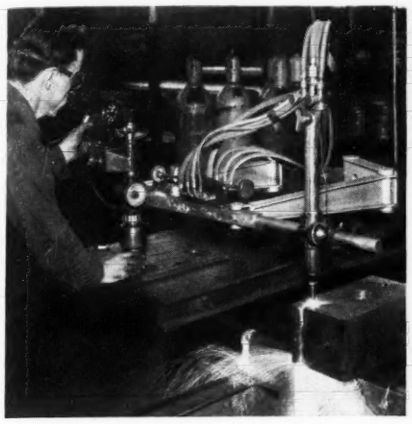
Wabash Appliance Corp., Brooklyn, N. Y.
Model: Silver-Lined Blackout Bulb.
Application: Designed for blackout lighting in air raids.
Description: Provides downlighting in a soft beam of blue light that is safe for indoor

visibility during blackouts. The bulb is lined with a pure silver reflector lining that hides all filament glare and projects the light downward. Light leaks are prevented by a black silicate coating that covers the bulb up to the extreme lighting end which is deep blue. The bulb uses 25 watts.

■ ■

Machine Cutting Tips

Air Reduction, 60 E. 42nd St., New York, N. Y.
Model: Airco "45" high speed machine cutting tips.
Application: For cutting metal thicknesses up to 8 inches.



Description: Manufacturer states that this series of oxyacetylene machine cutting tips increase the cutting speed of machine torches by 20% to 30% and assure cuts of a quality comparable to those obtained with standard tips. The Airco "45" tip has a nozzle with a divergent exit portion—a design that makes it possible to eject a narrow, high velocity stream of oxygen, practically free of exit turbulence, that burns a narrower path through the metal, than the conventional cutting tip. The Airco "45" tips are available in sizes 0, 1, 2, 3, 4, 5, 6, 8, and 10 and fit standard machine cutting torches.

■ ■

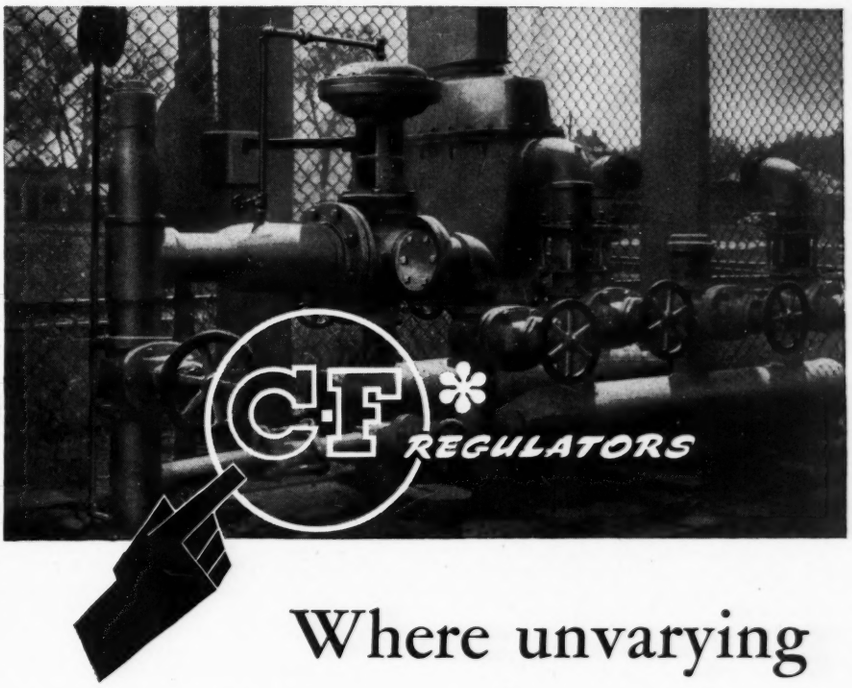
Blackout Paint

Maas & Waldstein Co., 438 Riverside Ave., Newark, N. J.
Model: Durad Luminous Paint.
Application: To render all objects visible in the dark.
Description: Unlike radio-active finishes used on watch dials, the paint owes its luminosity to a substance which re-radiates light, according to the manufacturer. It contains no toxic materials. After the paint has been exposed to either daylight or ordinary electric illumination for a few minutes, it glows for about 20 hours and repeats the action after re-exposure. The paint must be used over a special primer and thinned out with a special thinner, both of which are supplied with the paint.

■ ■

Thermometric Pellets

The Tempil Corp., 132 West 22nd St., New York, N. Y.
Model: New Tempilstik Thermometric Pellet.
Application: Provides a simple and convenient method of signalling desired preheating temperatures.
Description: Tempilstiks have a specified melting point. They are available from 125° F. to 1600° F., in convenient tem-



Where unvarying low pressure is required

As a district regulator — at distributing or measuring stations — in industrial plants, institutions and housing projects — wherever low pressure gas is consumed in considerable volume, the C-F Low Pressure Regulator gives perfect control. Any inlet pressure up to 100 pounds can be reduced to a constant delivery pressure from 2 to 16 ounces. Fully balanced valve with soft-seat construction for positive shut-off. Inside valve may be removed for inspection without taking regulator from line. Furnished with or without automatic cut-off, a safety feature which closes regulator when line pressure fails, and must be reopened manually. For domestic service or other installations requiring less volume, the C-F House Regulator is unequalled in performance or durability, reducing line pressures as high as 500 pounds to delivery pressures in ounces. There's a C-F regulator for every requirement in the control of either high or low pressures. Specific recommendations will be made on request.

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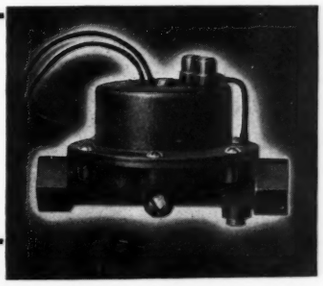
CONTROL VALVES



Klixon Electrically Operated Gas Valves do their work quietly and efficiently. There's no humming, chattering or sticking. They are snap-acting—operate by a Spencer Thermostatic Disc. No solenoids are used.

Sizes range from ⅜" to 1¼" I.P.S. "Puff bleed" is standard. "Constant bleed" at no extra cost. Manual opening with automatic recycling, slightly extra.

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perature intervals, and have a mean accuracy of within 1% of the temperature clearly stamped on each stick or pellet. Thus, a 300° F. Tempilstik, drawn across a surface heated to less than 300° F., will leave a chalkline mark . . . which melts sharply into a liquid streak when the surface reaches 300° F. The new Tempilstik offers a means of leaving a temperature signal mark on less accessible places, such as vertical, inclined and overhead surfaces. Properly used, each stick will yield up to 1000 temperature determinations. Tempilstiks come packed in a handy individual tube that fits the pocket and prevents breakage.

■ ■

Hot Water Control

Perfex Corp., 500 West Oklahoma Ave., Milwaukee, Wis.

Model: A "Strap-On" Type Hot Water Limit Control.

Application: For hot water heating systems.

Description: One of the line of twin contact controls. Easy to mount as the trough-shaped base permits a snug fit in direct contact with hot water pipes. Mounting requires only fastening of a metal strap to hold the control to either horizonal or vertical pipes, as satisfactory operation is obtained in any position. The mounting base and the thermal element are one and the same part in order to simplify design and to assure immediate response to changes in boiler water temperature. Temperature cut-out setting is made without removing the cover. Available for low or line voltage circuits, and in direct or reverse action models.

Catalogs

• The Foxboro Co., Foxboro, Mass., has just issued a bulletin (No. A-305), presenting the complete line of Foxboro Potentiometer Temperature Indicators and Indicating Resistance Thermometers. The instruments illustrated and described include single-point and multiple-point models, models equipped with selective key-switches for as many as 82 contact points, as well as the popular portable models. Single range and double range dials are shown in full-size reproductions and a complete list of standard ranges is given. Constructional features of the instruments are shown and described.

• Ideal Commutator Dresser Co., 1407 Park Ave., Sycamore, Ill., has issued a "New Variable Speed Transmission Catalog and Handbook" which includes 52 pages of recommendations, application data, photos and engineering information. It gives a quick index source of reference for complete data on the company's variable speed pulleys, variable speed transmissions and automatic tension control motor base. Also included are sizes, rated capacities, design and operating details explaining application and installation.

• General Controls Co., 801 Allen Ave., Glendale, Calif., has just issued a 48-page catalog of the company's complete line of regulators, control systems, and solenoid valves. Several new products are introduced for the first time, including small commercial size motor-operated valves, new three-way magnetic lever valves, sensitive D. C. relays, and the new type PV Series electric magnetic valves for airplanes, machine tools, trucks, tractors, buses, and hydraulic systems. Includes illustrations, photographs, reproduced blueprints, cross-sectional drawings, tabulated specifications and list prices on all items. This catalog, No. 51, will be sent upon request.

• Leeds & Northrup Co., 4901 Stenton Ave., Philadelphia, Pa., has issued a 16-page catalog (Catalog N-93-163) entitled, "Micromax Smoke Density Recorders" which is illustrated with many installation pictures and describes how men on the firing aisle can "see" smoke simply by glancing at the position of a big black pointer which moves around a giant dial. A schematic diagram shows how a continuously-flowing sample of smoke is drawn from stack, breeching or duct . . . how it is measured by a standard Micromax potentiometer recorder . . . and how the result is continuously indicated and recorded in terms of smoke density.

• Wheelco Instruments Co., Harrison and Peoria Sts., Chicago, Ill., has issued Defense Bulletin No. 1 telling how the national defense program affects purchase, use and maintenance of temperature measuring and control instruments. It is designed to aid industrial instrument users in defense and non-defense industries to gain maximum life and efficiency from pyrometric equipment now installed and being installed. It is designed to help all users of pyrometers, regardless of make, to maintain equipment so it will operate efficiently and give uninterrupted service.

• E. D. Bullard Co., 275 Eighth St., San Francisco, Calif., has just issued a free leaflet describing personal protective equipment recommended for air raid wardens, and some items, such as air raid sirens, for plant protection. Recommendations are based on information supplied by civilian defense authorities and the experience of the city of London. The leaflet shows the equipment necessary for groups of 25-50, 50-100, and 100-200 people, or for each floor of a building, and lists prices to help the purchaser determine the investment necessary to protect adequately his property and employees.

• Servel, Inc., Evansville, Ind., has issued (December 30, 1941) a Parts List (Form SVN-658) For Servel Gas Refrigerators, 1942 "N" Models. The catalog contains diagrams and number and names of cabinet accessories, unit parts, unit accessories, controls and control accessories. This catalog is published annually. Prices of the parts are contained in the Parts Price List, also published annually by Servel. Bulletins are issued periodically, as a supplement to the Parts List, announcing changes.

• The Edward Valve & Mfg. Co., Inc., East Chicago, Ind., has issued a new folder, No. 12-G5, Edward Intex Valves, describing hard surfaced integral seat globe stop valves for pressures to 1500 lbs. at 950° F. Design characteristics of ½ in. to 2 in. Intex valves, including description and dimensions in inches, weight in pounds, and ASA working pressure ratings are given. Cut-away diagrams and photographs illustrating the disassembly and accessibility of the valves are presented.

• Peabody Engineering Corp., 580 Fifth Ave., New York, has issued Bulletin No. 203 which describes and illustrates Peabody Combined Gas and Oil Burners Type A and Type H. Booklet describes the air registers, burner rings, oil atomizers, burner throat tile and the component parts of the burners.

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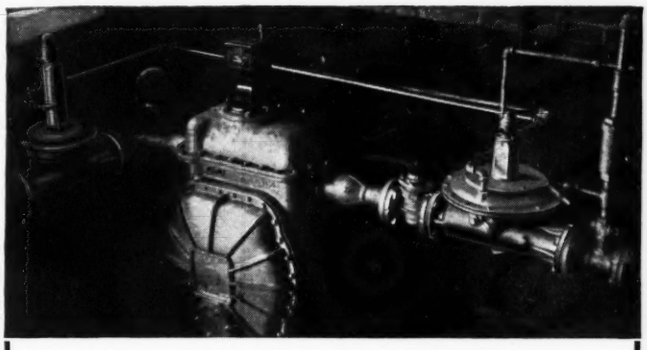

(Photograph of actual plant installation)

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REYNOLDS offers greater Capacity—Increased Range—Quicker Response—all features of Reynolds Gas Regulators for Industrial Control. They assure smooth, constant outlet pressure and volume. Manufactured in single or double valve construction, REYNOLDS Industrial Regulators are proved by performance in factory tests and on installations throughout the world.

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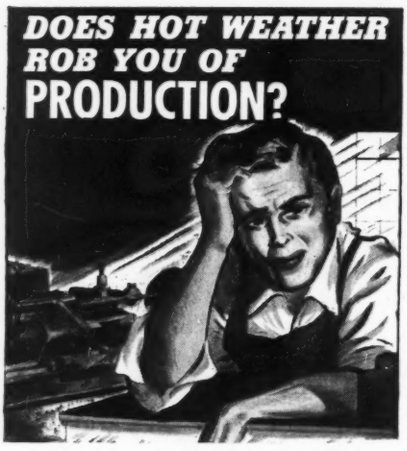

You can curb loss of working efficiency through hot summer days. Fatigue often can be corrected with salt tablets. Frequent, time-wasting brow-mopping can be stopped with comfortable, cooling sweat pads.
Proper protection will overcome fears of ivy or oak poisoning, or snake bites for outdoor workers. These, and other time-savers are described in a new folder: "HOT WEATHER NEEDS That Aid Working Efficiency". 1B-5

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Send new *free* folder: "HOT WEATHER NEEDS", outlining inexpensive methods of keeping up production through summer months.
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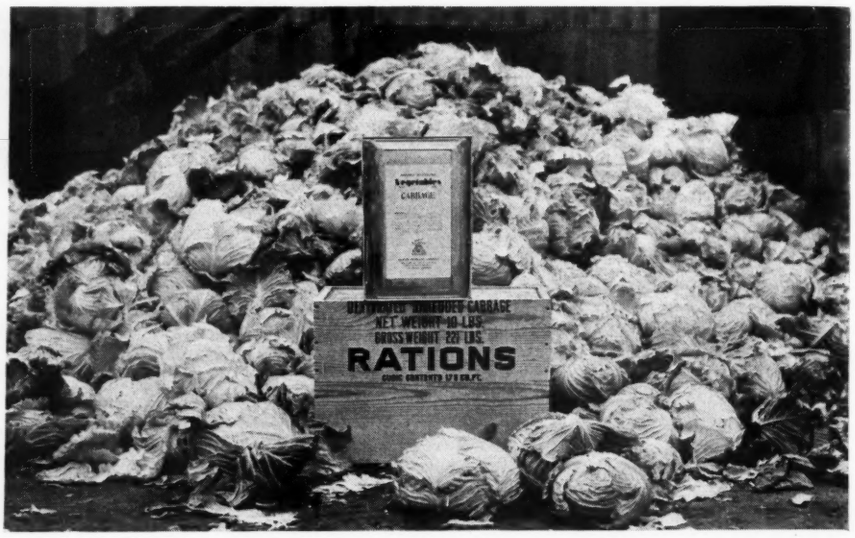


A pile of cabbage ready for dehydration at the Barker Food Products plant in Turlock, Calif. The tin container holds 5 lbs. of the finished product and there are two more like it in the wooden box—15 lbs. from about 300 lbs. of fresh cabbage.

Gas Used in Vegetable Dehydration

WITH the help of gas furnished by the Pacific Gas & Electric Co., San Francisco, Calif., six firms in northern California are now turning out more than 200 tons of dehydrated vegetables, reducing the weight to 1/6 to 1/20 of the original without affecting the taste and food value of the vegetables. Most of the output of the plants is going to America's armed forces.

The six dehydration firms are: the Barker Food Products Co., Turlock; the Dry-Pack Corp., San Jose; the G. B. Gentry Co., Gilroy; the California Vegetable Concentrates Co., Gilroy; the Basic Vegetable Products Corp., Vacaville; and Fred P. Knipschild, Yuba City.

In the Barker Co. plant enough gas is used every day to supply 2400 average homes. This company has 10 drying tunnels, each 54 ft. long, 7 ft. wide, and 7 ft. high. They are gas fired and equipped with thermostats and other automatic devices for regulating the period and extent of drying.

Cabbage, carrots, celery, potatoes, tomatoes, spinach, green beans, beets, onions and garlic are among the vegetables dehydrated. Some of these are sliced; others are shredded. The natural flavor is restored without loss of vitamins by adding water.

Dr. W. V. Cruess, professor of fruit technology at the University of California, who was largely responsible for the industry in 1918, is cooperating with the present drying plants and the Western Regional Research Laboratory of the United States Department at Albany, Calif.

During World War I, California furnished the War Department with more than $1,000,000 worth of dried vegetables for shipment overseas. Dehydrated vegetables were first used by England in the Boer War. In 1918, E. Clemens Horst, largest hop grower in the United States, was given a contract by the War Department for dried potatoes, spinach, carrots and other vegetables for the army.

■ ■

New Impetus Given Natural Gas Drilling in California

There has been a general stepping up of drilling activity for natural gas in the northern part of California during recent months. The Standard Oil Co. of California has secured a permit to drill a "prospective" natural gas well in Solano county. The Western Exploration Co. is drilling for natural gas in the Rio Vista area, and Tide Water Associated Oil has just completed a leasing program embracing 5000 acres just north of Dixon, in Sacramento county. The Trico Oil and Gas Co., with 30 producing gas wells in Tulare county, has closed a leasing agreement covering 1300 acres of prospective gas land near Paskenta, Tehama county.

■ ■

A. G. A. Publications List For 1942 Now Available

The American Gas Association, 420 Lexington Ave., New York, N. Y., has issued the 1942 List of Publications. Alphabetical order of divisions in the list are as follows:

Accident Prevention; Accounting Section; General; Industrial and Commercial Gas Section; Natural Gas Section; Rates; Industrial Gas Research; Residential Section; Statistical; Technical Section; and Testing Laboratories. Subdivisions under the headings of Requirements, Directories, and Reprints of Articles and Bulletins complete the list.

Lone Star Gas Co. Hearing On Rates Set for June 8

THE Federal Power Commission has announced that a public hearing has been set for June 8 in Dallas, Texas, on its investigation of the Lone Star Gas Co., which has its headquarters in that city.

The investigation was instituted last July on the commission's own motion to determine "(1) whether the said company is a natural gas company within the meaning of the Natural Gas Act, and (2) whether, in connection with any transportation or sale of natural gas subject to the jurisdiction of the commission, any rates, charges or classifications demanded, observed, charged or collected, or any rules, regulations, practices, or contracts affecting such rates, charges, or classifications are unjust, unreasonable, unduly discriminatory, or preferential."

The investigation was instituted following receipt of a petition by the city of Dallas, Texas, on June 14, 1941, alleging that Lone Star charged an unreasonable and discriminatory gate rate for natural gas sold to its affiliate, Dallas Gas Co. The order states that the two proceedings are related, and consolidates them for the purpose of hearings. In June, 1941, communications were also received from the Texas Railroad Commission. the Oklahoma Corporation Commission, and the city of Terrell, Texas, indicating their interest in the matter.

■ ■

Potential Tests Made in Oklahoma City Field

The oil and gas conservation department of the Oklahoma Corporation Commission reports that final semi-annual potential tests taken in the Oklahoma City field recently showed that 93 gas wells in the field have a combined potential of 211,433,000 cu. ft. daily.

These wells are owned by 18 operators, the largest being the Cities Service Gas Co., Bartlesville, Okla., with 38 wells having a potential of 129,091,000 cu. ft. daily. Other leading producers in the field include Anderson Prichard, with nine wells; Phillips Petroleum Co., with eight wells, and H-P Gas Co., with seven wells.

■ ■

Shell Applies for Recycling Permit in Sheridan Field

Shell Oil Co., Inc., has made application for the construction of a recycling plant in the Sheridan field, Colorado county, Texas. A hearing on the company application was held before the Texas Railroad Commission April 6.

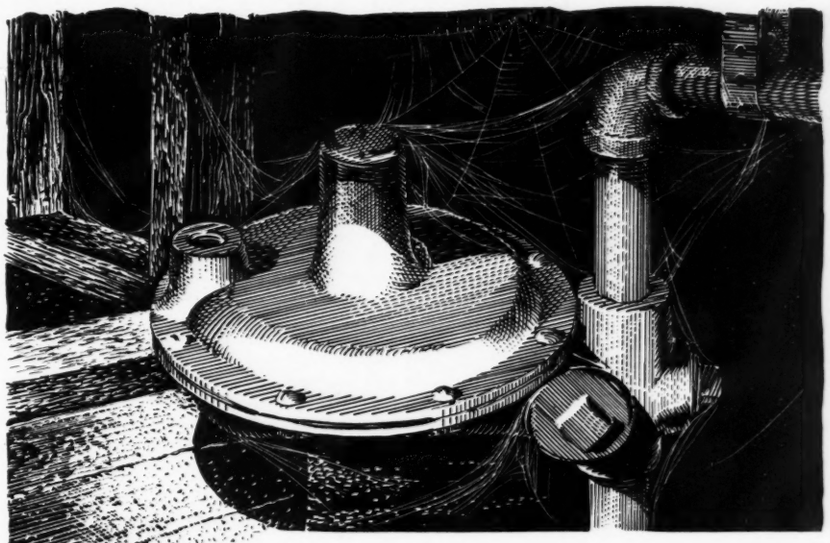
The Sheridan field was discovered in 1940 and subsequent development has opened gas-distillate production from several sands in the Wilcox formation at intervals from 8100 to 10,000 ft.

■ ■

Wisconsin Utilities Plan to Spend $26,458,842 in 1942

A survey by the Wisconsin Utilities Association reveals that the 31 larger electric and transportation companies in Wisconsin are preparing to spend this year $26,458,842 for additions to and maintenance of their properties as against $22,417,078 spent in 1941. Budgets for gas companies totaled $2,149,715. The larger budget prepared by the companies is due to increased demands for utility services created by war conditions.

The most neglected servant in the house —



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Gas Usage Up Sharply in Memphis Industrial Area

NOT ONLY war industries, but standard Memphis business are contributing to the huge industrial increase in the use of gas in Memphis, Tenn., according to R. P. Haslep, industrial engineer of Memphis Natural Gas Co. The city is now using approximately 106,000,000 cu. ft. per day, or a 40% increase over 1941. Most of this is credited not to direct government production, but to such industry as cotton mills, foundries, schools and industrial heating load.

Actually more commercial gas installations have been made in the last six months than in the entire period since natural gas was introduced in 1929, according to Mr. Haslep. Among outstanding conversions of the past few months are 11 city schools, all now heating with gas, and the boilers of the city water pumping station owned by the Memphis utility. To provide more gas the company recently looped around four compressor stations with a 60-mile pipe line, and is contemplating parallel lines if priorities allow for it.

Other industrial users are a new Delta Oil Co. refinery using 1,000,000 cu. ft. a day, opened in late 1941, six Memphis cotton compressors all converted over from coal, and a large fibre can company making government packaging equipment.

■ ■

Servel Refrigerator Aids Red Cross "Blood Bank"

The campaign of the Buffalo, N. Y. Chapter of the American Red Cross to build up a "blood bank" in case of emergency, has a competent "worker" in the guise of a Servel Electrolux gas refrigerator.

One of these refrigerators is being used to store the donations of human blood which the Buffalo chapter recently called for in initiating its plan for a blood bank ready for emergency call.

After the blood is given at a Buffalo hospital, it is shipped to a plant where the liquid is withdrawn and the remaining solids are reduced to powdered form for storage until used. The gas refrigerator is used to protect the blood in the hospital before shipment. It was obtained through the Iroquois Gas Corp., Buffalo, and its shelves were specially arranged to hold 50 pint bottles of blood.

■ ■

Civil Air Patrol Watches Nation's Vital Pipe Lines

An undisclosed number of the civil air patrol's 38,000 licensed pilots have begun patrol duty over a large part of the nation's vital pipe lines and power conduits and soon may patrol forests for fire prevention. The patrol of pipe lines and power lines is directed primarily against sabotage.

■ ■

Consolidated Edison Issues Annual Employees Report

The 1941 taxes of Consolidated Edison Company of New York, Inc., and its system companies amounted to $1842 for each employee, according to the company's annual reports to employees which was mailed to employees' homes April 6.

The employee report, called "Our Company and Our Business—1941," gives a break-down of the average dollar of revenue of Consolidated Edison System companies during the year, and discusses in simplified terms how they operated as a business.

The introduction to the report is signed by the three chief executive officers of the companies, Floyd L. Carlisle, chairman; Oscar H. Fogg, vice chairman; and Ralph H. Tapscott, president.

■ ■

B. C. Electric Railway Co. Installs Galvanized Kettle

The B. C. Electric Railway Co.'s industrial engineers have completed the installation of Canada's largest gas-fired galvanized kettle in the new plant of Dominion Rustproofing Co., Vancouver, B. C.

Twenty-two ft. long, 40 in. wide and 40 in. deep, the huge kettle is constructed of 1¼-in. fire-box steel with a capacity of 60 tons of molten zinc. The kettle is capable of turning out 16 tons of zinc-coated steel per eight-hour shift. Final decision to install gas firing for the kettle was reached only after comparative study indicated gas to be the most practical fuel for the purpose.

With the use of gas the life of the kettle is extended from two years to approximately six years. Using gas, a constant temperature of 850° F. with a variation of but one degree is maintained. This control eliminates over and under heating, prevents over-heated zinc from reacting with the metal of the kettle itself and prevents "freezing" of the zinc.

■ ■

Pacific Gas & Electric Co. SEC Petition Denied

The Ninth Circuit Court of Appeals has denied a Pacific Gas and Electric Co. petition to set aside an SEC order terming the P. G. & E. a subsidiary of the North American Co. of N. Y. The court held that the P. G. & E. should be classified as a North American subsidiary under the 1935 Public Utilities Holding Company Act which defined a subsidiary as any company in which 10% of the stock was held by another company. The effect of this decision is that the P. G. & E. cannot sell its securities without SEC permission.

■ ■

Texas Co. Brings In Another Gas Well Near Bakersfield

The Texas Co. has brought in another gas well in the Buttonwillow field 15 miles west of Bakersfield, Calif. Unofficial reports state that the first two wells in this new field have demonstrated that they can produce between 10,000,000 and 15,000,000 cu. ft. per day. Due to threatened gas shortage in California, it is believed that the field may turn out to be very profitable. The producing sand is found at about 4700 ft.

■ ■

Civil Service Examinations For Scientists Reannounced

In an effort to meet the increasing needs of the defense program for scientifically trained men and women, the Federal Civil Service Commission has reannounced, with modified requirements, three of its examinations for scientists. The reannounced examinations are those for Physicist, Explosives Chemist, and Chemical Engineer positions, with salaries in each field ranging from $2600 to $5600 a year. For all, appropriate college study and experience are required.

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HAVE A SUPPLY OF THESE STOPS ON HAND

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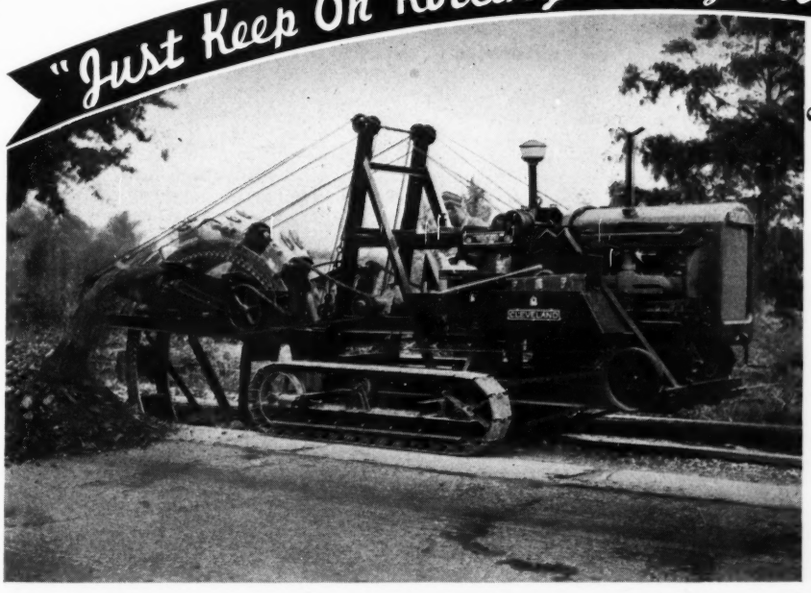

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Pittsburgh's New Housing Project Cooks With Gas

THE second largest housing project in the country, Terrace Village, Pittsburgh, Pa., called "The most dramatic housing project in America," is now fully occupied and is using gas for cooking. Bids on the project opened more than a year ago, and with arrangements running close to schedule, the project became fully occupied soon after the first of this year.

Contracts specified that gas lines be laid on good ground. To provide the safety factor, engineers considered both estimated current and future needs of families using a great deal or a limited amount of gas. In order to handle the flow of gas for the entire project, Peoples Natural Gas Co. built one meter station on the border of the village.

Terrace Village provides homes for families that formerly paid approximately $10 monthly rent for a "bandbox" with no bath. Now they pay $10 for monthly rent, including cost of the gas consumed. Each home has a cook stove. Terrace Village No. 1 has 802 gas units, Village No. 2 has 1851 units.

Gas is not metered to individual units; instead, gas consumed by each unit of the project is measured, and the cost is averaged and figured into the rent. Annual gas consumption in Terrace Village for cooking as averaged by the utility company totals .8 M c. f. per family per month.

■ ■

North American Co. To Sever Relations with 56 Companies

The North American Co., New York, N. Y., has been directed by the Securities and Exchange Commission to sever its relations with 56 companies in its huge utility system.

Under the SEC order, North American would retain only one of its eight major subholding companies, the $273,000,000 Union Electric Co. of Missouri. The reductions must be effected within a year.

Among firms ordered severed from North American are Detroit (Mich.) Edison Co., with assets of $370,000,000, and Pacific Gas and Electric Co., San Francisco, Calif., and its subsidiaries, with assets of $790,000,000.

"It seems clear that a very large part of the divestments and dispositions necessary," said the SEC, "may be effectuated by stock dividends, by exchanges of portfolio securities with the security holders of the holding company, and through exchange of properties between systems."

■ ■

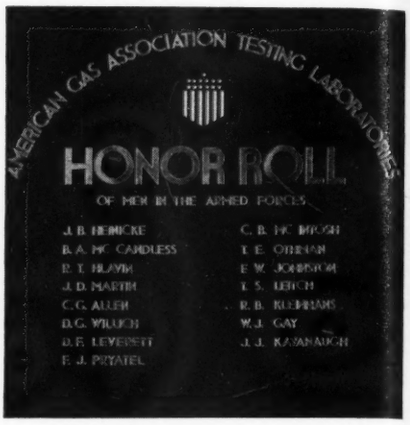
Southern California Gas Co. Issues Largest Taxes Check

The Southern California Gas Co. (Los Angeles) check for $1,126,824.66 was the largest single payment of city and county taxes received by H. L. Byram, Los Angeles County Tax Collector, for the 2nd Installment of 1941 ad valorem taxes. The check was signed by G. A. Detrick, treasurer, and H. L. Phelps, assistant treasurer, of the Southern California Gas Co.

■ ■

A. G. A. Laboratories Honor Engineers in Armed Forces

In recognition of the service former staff members of the American Gas Association are now rendering in the United States armed forces, an honor roll placque has been dedicated at the American Gas Association Testing Laboratories, according to R. M. Conner, director. Fifteen men are already included



on this honor roll, 13 having been employed at the Cleveland laboratories and two at the Pacific Coast branch in Los Angeles.

Mr. Conner revealed that the names listed represent nearly 20% of the Laboratories' full engineering staff. It is of interest to note that five of this number were reserve officers in the Army and Navy, five enlisted, and the remaining three were selected.

Prominently mounted at the head of the stairway where it may be seen by all entering the Cleveland Laboratories, the placque is appropriately simple and dignified. In keeping with the national metals conservation program, it is constructed of stained plywood with silver finished lettering and adorned with a small shield of the Stars and Stripes. The placque is illustrated in the accompanying photograph.

■ ■

Circuit Court Concurs With Wage-Hour Group on Issue

Baird Snyder, Acting Administrator of the Division, maintains, in the opinion just handed down by the United States Circuit Court of Appeals for the Fifth Circuit at New Orleans, La., that the position of the Wage and Hour Division, U. S. Department of Labor, is upheld in regard to oil drilling operations which result in "dry holes," as well as drilling which brings in gushers and that these operations are subject to the Fair Labor Standards Act which entitles employees engaged in such operations, unless specifically exempted, to receive the minimum wage and overtime benefits of the law.

The Appeals Court opinion, which reverses the decision of Judge James C. Wilson in U. S. District Court for the Northern District of Texas, at Fort Worth, grants a verdict for overtime pay for O. V. Hall and other employees against the Warren-Bradshaw Drilling Co.

■ ■

Oklahoma Natural Abandons Petition for Increase in Rates

The Oklahoma Natural Gas Co., Tulsa, Okla., has abandoned its appeal from a Corporation Commission order declining to permit the company to put its state-wide rates in effect in cities where it acquired gas service by purchase of properties of Central States Light & Power Co.

The company had asked that its rates go into effect in the 21 Oklahoma cities formerly served by Central States but the commission held that the acquisition of Central States' property did not automatically give the company the right to change rates for any city.

FPC Enlarges Investigation of Panhandle Eastern Rates

THE Federal Power Commission has enlarged its investigation of natural gas rates of Panhandle Eastern Pipe Line Co., Kansas City, Mo., and Michigan Gas Transmission Corp., Detroit, Mich., to include the investigation of the rates of the Illinois Natural Gas Co., Kansas City, Mo. Hearings in the proceeding were recessed by the Commission's Examiner in Detroit on March 3 and reconvened on March 30.

The order states that during the hearings, the Panhandle company presented evidence showing that its wholly-owned subsidiary, the Illinois Natural company, purchases gas from Panhandle at several points in the State of Illinois, transports the gas in interstate commerce, and resells it to distributing companies for retail distribution. Evidence respecting revenues, expenses, costs, return, and other data, the order states, has been presented on a consolidated basis for the Panhandle Eastern and Illinois Natural Gas companies, and counsel for Panhandle have stated that the Illinois company is "an operating department or arm of the Panhandle Eastern Pipe Line Company" and that they "are disregarding the separate corporate entity of these two companies in this investigation."

■ ■

Texas Gas Lines Weather Worst Flood in 34 Years

Two days after north Texas was swept by a 34-year record-breaking flood, pipe lines of the Lone Star Gas Co., Dallas, Texas, were reported weathering well the unexpected occurrence. Only line damage done by the swollen tributaries of the Trinity river were on the Community Natural lines at Carrollton, Texas and Elmore City, Okla. The latter district was without gas for an hour when the tap line into the town was damaged. No other interruptions occurred in this area.

At Carrollton, a distribution line which served about 20 customers went out when the highway bridge to which it was suspended was washed away. No other customers were affected and the 20 customers were returned to service within a few hours.

■ ■

Large Coke and Coal Users May Build Up Inventories

Large users of coal and coke, especially utilities and industrial users, are being urged by the Division of Industry Operations to build up their inventories as much as possible to avoid the danger of having to suspend operations in case of an emergency.

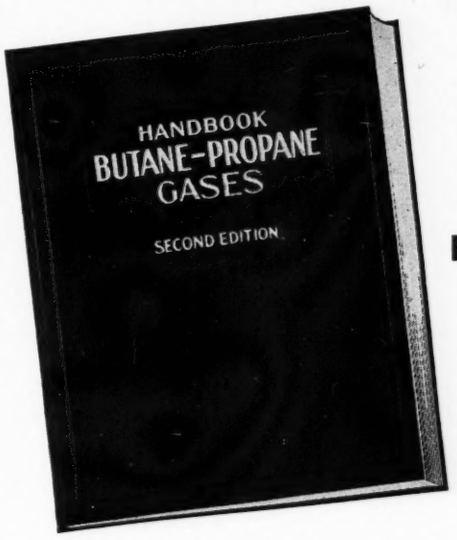
General Inventory Order M-97, issued in February, revokes the inventory restrictions imposed by Priorities Regulation No. 1 insofar as they apply to coal and coke. The order will enable large users to take advantage of the fact that there is at present considerable excess production of coal and coke, and transportation available for distribution of these materials. Inventory restrictions are relaxed for coal and coke only.

■ ■

Regulator Co. Moves Branch

J. D. Poythress, Dallas, Texas, branch manager of Minneapolis-Honeywell Regulator Co., has announced the removal of the Dallas branch to 1907 Federal St. J. P. Ashcraft, George Koehler and Mr. Poythress are associated with the office.

WHILE THEY LAST



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Exceptions Filed Against Pennsylvania Rate Ruling

THE Peoples Natural Gas Co., Pittsburgh, Pa., on April 8 filed exceptions to the recent ruling of the Pennsylvania Public Utility Commission which orders a refund to consumers for 1940 and 1941 on the ground that total revenues in those and succeeding years should not exceed 1939 income. Such filing automatically prevents the order from becoming effective until after the Commission passes on the exceptions and issues a final order.

Exception is taken to the Commission's ruling that domestic consumer rates should be changed each year depending upon the fluctuating amounts of gas purchased by large manufacturing industries. This would compel the small user "to pay much higher rates in depression periods, just when the ordinary consumer has the greatest difficulty in meeting his bills." Also, the ruling is in gross error, the company claims, since it fails to take into account the far greater expenses incurred since the rise in war production, including gas purchases, higher labor and material costs, and mounting taxes. These soaring costs with a fixed price ceiling on revenues, will prevent the company from earning even the amount the Commission has decided permissible.

■ ■

Isobutane Unit at Salem Plant Completed in May

Facilities for the recovery of 10,000 gal. of isobutane daily are being installed at Salem, Ill., for Sunflower Gasoline Corp. The construction work is expected to be completed by the end of April, at which time the new isobutane plant will start operations.

Sunflower Gasoline Corp. and its affiliate, Sunflower Natural Gasoline Co., operate two natural-gasoline plants in the Salem field. Both plants are of the absorption type and have combined capacity of 165,000 gal. of natural gasoline daily and 82,500 gal. of liquefied petroleum gases. The isobutane plant is being installed by the L. S. Gregory Co. of Tulsa, Okla.

■ ■

Laclede Bond Extension Plan Approved by SEC and PSC

Approval by the Securities and Exchange Commission and the Missouri Public Service Commission of the proposal to extend for three years, $12,000,000 in bond and note obligations of the Laclede Gas Light Co., St. Louis, Mo., was granted recently and solicitation for the consent of the bondholders was started in the early part of March. It is necessary to secure the consent of approximately 70% of the holders of the bonds in order to declare the plan operative.

This action opens the way for the final reorganization of the company, according to L. W. Childress, president. The reorganization, according to Mr. Childress, contemplates the simplification of the capital structure of the company and integration of the gas and electric properties in St. Louis and will provide means for the eventual sale of the control of the reorganized gas company to the residents of Missouri.

■ ■

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May "McCall's" Article Tells Efficiency of Gas Ranges

Appearing on page 46 of the May issue of *McCall's Magazine* is a feature article that stresses the efficiency of gas ranges by Kathleen Robertson, *McCall's* appliance editor, and Hilda Ungericht, home service director of the Ohio Fuel Gas Co., Columbus, Ohio. The article lists three steps in vegetable cooking that save gas and retain the valuable vitamins and minerals.

The recipes with the article emphasize low cost foods that come out with high cost flavor when they are correctly cooked over gas. Miss Robertson suggests a savory steak roll with lima beans that is economical even at 2 to 2½ hours cooking time. The gas flame can be turned very low and still give all the heat needed while it's saving on the fuel bill. Miss Ungericht plans a lamb creole and macaroni dish that tastes just right because proper seasonings to give it zest can be blended beautifully over slow gas cooking.

■ ■

Gas Production in Kansas Sets All-Time Record in 1941

Natural gas production in Kansas reached an all-time high in 1941 when 93,426,773,000 cu. ft. were reported, an increase of approximately 9% or 7,808,988,000 cu. ft. over 1940. The principal increase came from the Cunningham field where production rose over 50%. Hugoton's output was 9% greater than in 1940.

Production from the old fields in the eastern part of the state declined but more than half of this decline was offset by production from the newly discovered McLouth field in Jefferson county. With the exception of scattered gas production in Barton, Ellsworth and Rice counties production from all but four fields declined. These four fields, Hugoton, Cunningham, Thurber and McLouth, now produce about 55% of Kansas' gas.

■ ■

FPC Gives Temporary Permit To Natural Gas Pipeline Co.

The Natural Gas Pipeline Co. of America and Texoma Natural Gas Co. have been given a temporary permit by the Federal Power Commission to operate an existing 4-in. lateral pipe line to serve natural gas to DeKalb and Sycamore, Ill.

The companies will interconnect their facilities with those of the Illinois Northern Utilities Co., community gas distributor.

■ ■

New Office at Malvern, Ark.

The Arkansas-Louisiana Gas Co., Shreveport, La., has opened a new office in Malvern, Ark. Manager of the office is Glen Harrington who will be assisted by Miss Hattie Goodman, cashier.